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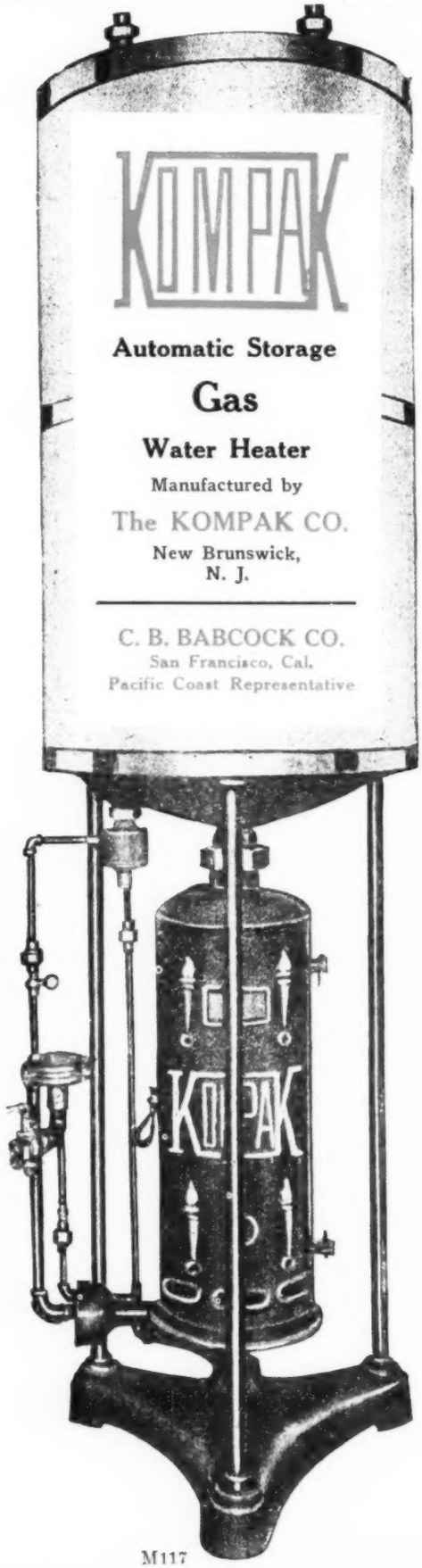

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FORMERLY THE AMERICAN GAS LIGHT JOURNAL

Vol. CXIII, No. 15 NEW YORK, OCTOBER 9, 1920 Whole No. 3266

Tracing the Gas Industry's Labor Problem to Its Source

The Worker's Responsibility to the Public—He Has His Clear Ideas as to How Far It Goes and His Ideas Must Be Taken Into Account

By WALTER A. FAIRSERVIS

Is labor essentially dishonest?

That is a question which was asked the writer recently by a large employer of unskilled help in discussing the labor problem that is confronting the United States to-day. By dishonest, he did not mean stealing in the generally accepted meaning but rather, Is labor willing to return full value for wages received? This man, a power in the public utility field to-day, declared that any labor whether skilled or unskilled that decreased its production through its own willingness was not honest and was not playing its part in the tremendous program that is facing the United States.

It can generally be accepted as a fact that labor in its bargaining with capital really believes that it is downtrodden; that it is not getting the square deal that it should. This line of reasoning, which has been proved time and again to be wrong, brings an investigator at once to the elements that are responsible for this condition. It is easily found: The radical propaganda of the day is the complete and final answer.

Instances of this can be found on every hand, and thinking men are combating it in every possible way in order that the recovery from the effects of the world war may be hastened. But the Red element is becoming more and more a power in the public utility field and from what can be learned is getting more and more a hold on the gas industry. This may seem to be a broad statement, but if such a thought has occurred to the reader we would like to have him make just a simple test. Name over the men in your plant who cannot speak English, or who, if they have a smattering of the tongue, can either read or write it. We think you will be surprised in the result of your investigations. We were almost tempted to ask the reader to also put the question to himself: How much of the responsibility lies with you for this condition? But we won't.

The most recent strike in which the public was most vitally affected was the strike of the Brooklyn Rapid Transit Company. The men leaving their places tied up several million people and caused untold hardships, and, in fact, for a few days threatened to disrupt business generally. During this strike radicals became most daring in their advice to the men and this daring reached its climax at a meeting on Sept. 8, 1920, when pamphlets were circulated containing the following statement:

"Make this a political strike and get ready for an armed revolution to overthrow the capitalist government and create a workers' government, as your brothers did in Russia. Stop asking merely for a little more wages. Overthrow the dictatorship of the capitalist—the present Government of the United States—and through the Soviets and the proletarian dictatorship take possession of the B. R. T. and of every mill, mine, factory, railroad, field and farm in the United States. The Communist Party of America sounds the call for revolution—for the armed uprising of all the workers."

That is the type of circular that is being circulated to-day and they are printed not only in English, but also in practically every foreign language so that none shall be overlooked. Perhaps it will be said that if there is a portion of labor that cannot read or write that this portion then will remain in ignorance of what is going on. Such a thought merely means an attempt to deceive ourselves, for while it is true they cannot read, anything can be read to them or is repeated to them, and remember the apostles of this Red propaganda are active at all times, gains that much strength, for it is a fact that has repeatedly been proved that the uneducated holds a fear of the printed word.

Commenting on the circulation of just such pamphlets as these the American Defense Society, which is doing excellent work in fighting this propaganda, has this to say:

"Such an appeal to disappointed men, mad with passion and anger, is dangerous to the nation. Lawlessness, disorder and the almost total disregard for the safety and welfare of the public have marked from its start this violent effort of the minority to impose its selfish will on the public.

"Violence has characterized every recent strike in

Greater New York and always the Red Radical is present to add fuel by misrepresentation, innuendo and insinuation to the flames of anger.

"The world is small. In Italy the workmen have just seized by violence the factories and industrial plants; have armed and entrenched themselves therein and announce that they will operate the confiscated properties for their own gain.

"Red agitators are now actively taking a lead in labor disputes in America."

Therein is sounded a warning that can well be heard by the gas industry, for we are no more immune than are any other labor employing class. And the gas industry has not been free from the tactics that characterize the outbreaks of the Reds.

It was just a short time ago that Ralph Elsman, vice-president of the Kings County Lighting Company of Brooklyn, announced that he had settled a wage dispute with his production department by granting an increase in wages. In making this announcement Mr. Elsman told of the circumstances surrounding the dispute and every thoughtful operator can gain a lesson that it will be well to bear in mind.

According to Mr. Elsman, a shift due to report for work at about midnight in his plant, sent representatives to him bearing a demand that their wages be increased at once or they would not report. It was a Saturday night; there was no way in which this condition could be met except by granting the demands of the men. Now once this preliminary demand was won, the men, believing that they had gained an easy victory, they added to their desires the fact that the wage increase should be retroactive to the first of the month previous. There was nothing to do but to grant this demand, Mr. Elsman states.

Now, it is gathered that a failure on the part of the company to grant the demands would have resulted in the men striking and this would have meant that the company would have had to take gas off the territory, with the probability of a calamity following. Did the men in threatening this strike give any thought to the consequence of their act, the hardships and possible loss of life that might result? It is hard to believe that they did. Here, then, is a case within our own industry of men who have forgotten to some extent, if not altogether their duties to the public, and it is a tribute to the management of the company that despite its financial trouble, it had courage enough to meet the situation.

There probably are scores of other cases of similar happenings throughout the United States which have not come to the attention of the writer, but which are warning signals of what may come unless drastic action is taken.

A natural question that arises at this point is: What is being done to eliminate this element from our midst? And here we come to the Government authorities, and we find two bureaus that are at loggerheads. Recently a man high up in the Secret Service of the United States was questioned regarding the activities of his department in dealing with the radicals. He told of arrests that had been made and of the removal of the prisoners to the custody of the Immigration Bureau for deportation. He declared that some of the most dangerous men that had been seized were not deported, but instead were released and are to-day enjoying the hospitality of the United States while they continue to carry on their propaganda. In explanation of this the immigration authorities declare that the laws covering deportation are in such condition that in some cases they dare not take this drastic action, particularly with some newspapers ready to attack them and the administration for such actions. Then, too, there is an element among our own citizens who are only too ready to befriend and defend these aliens. And, as stated in our last article, not all of these radicals are aliens. Citizens of the United States have pretty well defined rights and it is indeed a brave man who dares take action against a citizen and accuse him of being a radical.

There have been efforts to organize the men of the gas industry into one powerful union, which would dictate the terms and conditions under which its members would work. This effort, happily, has not been as successful as it might have been, but there is one city in which we know there is a union that has a strong membership and which has attempted to force the companies with which its members are connected to bow to their terms. This effort has failed but the union, which has developed into a sort of secret society, is continuing in existence and the leaders have not abandoned any of their ambitions.

This union, which claims to be gaining converts in various sections of the country, called a strike of the men in one department of a large gas plant. The men responded to the call, and for weeks thereafter the leaders gave out statements in which it was claimed that it was winning converts every day and that it was defeating the companies. The strike ended with a compromise on the wage question and no recognition of the union but it was an indication of the way in which the wind is blowing.

Discussing the duties and obligation of labor to the public, particularly in the gas industry, a skilled laborer who is not given to wild statements, said that he believed the men had the right to strike at any time and in any way that would best produce the results it desired.

"You speak of the obligations of a man to remain on his job under conditions which are not satisfactory to him," said this man, "and I'll agree that any contract within reason should and must be carried out. But, and I'm sure you will agree with me, labor, whether skilled or unskilled, is usually employed by the day or at most by the week. Now if at the end of a day or a week I am not satisfied I believe that I have a perfect right to leave my job unless the conditions I object to are remedied. And if I persuade my fellow workers to leave with me I am still within my rights, provided I don't practice sabotage at any time or in any way."

"But how about the suffering of the public that may result from your action? Don't you feel that you must recognize such an obligation and put the interests of the greater number ahead of yours?"

"Why should I? I have carried out my obligations when I have completed the work for which I was hired, whether I am employed from day to day or from week to week. Once I have ended that period then I have no obligations. Even if I have, which I won't admit, hasn't the man who is managing the property a greater responsibility to the public? Isn't it for him to meet me at least half-way in an effort to recognize my rights? In other words, doesn't his responsibility to the public make it necessary for him to

(*Continued on page* 288.)

Use of Governors and Regulators in Gas Distribution

W. M. Henderson Describes San Francisco System and Methods Employed—Necessity of Carefully Guarding Against Supplying Consumer More Gas Than He Is Charged for

The constant increase in demand for gas, the development of industrial and heating loads, with peak-hour requirements, and the extension of gas service into suburban territory has permanently established the high pressure system of gas transmission and distribution.

Existing low-pressure distribution systems in cities are inadequate to cope with the demand in many instances, declared W. M. Henderson in a paper before the Pacific Coast Gas Association convention. To relieve the situation it is usually the practice to increase the normal pressure carried on the system. This solution is satisfactory only up to a point where the main pressure does not exceed 12 in. at the consumer's service. There are many instances of low-pressure distribution above this pressure but in all such cases, providing the pressure is fairly constant at the consumer's service, the service conditions are good. The limit of 12 in. is arbitrary, but the point of maximum pressure at the consumer's meter is somewhat controlled by its effect on the accuracy of the meter registration.

How It Affects Meter Registration

This fact should always be borne in mind when studying a distribution system with the view of increasing its capacity. Increased pressure affects the capacity of the mains in two ways. First, it provides greater velocity and naturally larger capacity, as it permits a greater difference in pressure between initial and terminal. Second, it increases the storage of the main by compression. This latter is very slight when pressure is measured in inches of water. Nevertheless it is to be considered, for the registration of the gas meter is affected by varying the pressure. The gas meter is proven accurate at 2 in. water column. This is considered standard. If the pressure under which it operates is increased, then more standard gas will be necessary to fill its measuring compartment. Yet the registration of the meter will be the same in cubic feet. If such gas was reduced to 2 in. pressure before entering the meter it would expand. The higher pressure is a loss to the company distributing gas. The loss represents 1 per cent for every approximate 4 in. pressure of water column. At 12 in. water column at the meter a loss of 2½ per cent in registration is possible.

When the loss in meter registration is excessive other solutions must be considered. Installations of larger low-pressure trunk lines with lower pressure are the ideal. As the new business developed is usually further from the location of the works or is in suburban territory such an investment is generally prohibitive. The choice of a plan is dependent upon the interest charges on the large capital outlay compared with the interest charges of a smaller investment in a high-pressure system plus the operating charges of same. Either system solves the problem, the high-pressure being a little more flexible, but this is offset by the reliability of the low-pressure system.

High-Pressure Systems Becoming Order of the Day

High-pressure systems are becoming the order of the day. They are of three types of combination of such. The high-pressure transmission of gas with district governors supplying a medium high-pressure distribution system or a low-pressure system. The next method and the one most prevailing is the high pressure distribution with individual regulators on the consumer's service. The third is similar to either except that high-pressure gas is sold direct to the consumer with or without service regulation. These latter cases are remote, but with the development of industrial business they are coming into existence.

The first method suggested required the installation of district governors. When this system is used for maintaining the pressure on low-pressure mains a more sensitive governor is used than the type adapted for reducing high to medium high pressure.

There are various types of these sensitive governors on the market and all operate on the same simple principle. Properly installed and cared for they give equal satisfaction. But one type is given consideration here, for the reason that it is universally used on the system that the writer has had experience with. This governor is the duplex type, double diaphragm; it is quite compact, all its mechanism being in one unit. The governor is only suitable for delivering pressures less than 14 in. of water column, where pressures in excess of this are required the single diaphragm pattern of the same governor is used.

Selection of Location of Utmost Importance

The first detail in the installation of a governor is the selection of a location. This is controlled by the pressure mains and the altitude of the various possible locations. A study should be made of the demand for gas in the locality. This with the view of selecting a

CAPACITIES OF LOW PRESSURE GOVERNORS AT VARIOUS INITIAL PRESSURES-FOR 0.65 SPGR. GAS

SIZE OF GOV	INITIAL PRESSURE 100.39 in. SPG=.65	TERMINAL PRESS-DR 10.39 in. SP.GR.65	DROP IN PRESSURE 100.39 in. SP.G=.65	MEAN EFF PRESSURE 100.39 in. ABSOLUTE	DISCHARGE CUBIC FEET PER HR.
2"	5	0.217	4.783	17.31	81270
2"	10	0.217	9.783	19.81	129500
2"	15	0.217	14.783	22.31	162750
2"	20	0.217	19.783	24.81	198240
2"	40	0.217	39.783	34.81	332850
2"	60	0.217	59.783	44.81	463260
4"	5	0.217	4.783	17.31	272610
4"	10	0.217	9.783	19.81	416520
4"	15	0.217	14.783	22.31	542880
4"	20	0.217	19.783	24.81	662220
4"	40	0.217	39.783	34.81	1113690
4"	60	0.217	59.783	44.81	1646190
6"	5	0.217	4.783	17.31	640500
6"	10	0.217	9.783	19.81	962500
6"	15	0.217	14.783	22.31	1256500
6"	20	0.217	19.783	24.81	1535000
6"	40	0.217	39.783	34.81	2572500
6"	60	0.217	59.783	44.81	3380500

governor suitable for the load. Too large a governor will prove unsatisfactory just as one too small.

The reduction in pressure is controlled by the area of the orifice produced by the valve movement of the governor. If the governor is too large the valve movement is slight and the resultant high velocity of the gas passing through the restricted area will cut the seats and prevent proper seating of the valve when governor closes. The proper size governor is not a difficult problem because considerable leeway is allowed in the selection of the governor and a fairly approximate estimate can be made of the gas requirements. Governor capacities are given on an accompanying table. These are maximum quantities at the outlet of the governor, and allowance must be made for length of pipe used for conveying the gas from the governor.

Installation an Important Detail

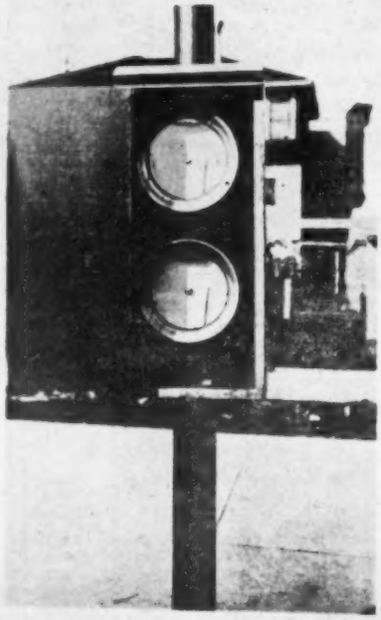
The installation of the governor is the most important detail. Properly installed, there will be little difficulty with its successful operation. The installation controls the whole operation. It must be borne in mind that it is just as important to have a governor close tightly automatically as it is to have it open at the required moment. Too many governors leak when supposedly out of service. This difficulty can be best controlled at time of installation. Herein is the result of considerable experience with the operation of governors as well as the making of many new installations. Some of the minor details prove just as important as the governor itself.

Tight Gas Valves an Essential

Tight gas valves are essential. It is necessary at times to remove the governor service for the purpose of renewing the diaphragm or renewing the seats. This can be done in the governor pit, but our practice has been to bring the governors to the shop. In either case a tight valve on the inlet and outlet is necessary. Otherwise the workmen are liable to be exposed to the leaking gas. This, in a sub-surface pit, is to be avoided. The dirt and scale carried by gas lines is very hard on gas valves or stopcocks. The valve is naturally open and sediment collects in the seat of the valve or the core of the cock. This is readily avoided by taking care to locate all valves on vertical piping. Then when open any sediment drops through, or if closed it collects on the disc and is pushed off upon opening the valve. Complete success has been had with this simple method of installation. Stopcocks for gas are not as satisfactory as gate valves, particularly the large sizes. The surface of contact makes them hard to move and the high-pressure gas dries up the lubricant if any is used on the moving surfaces.

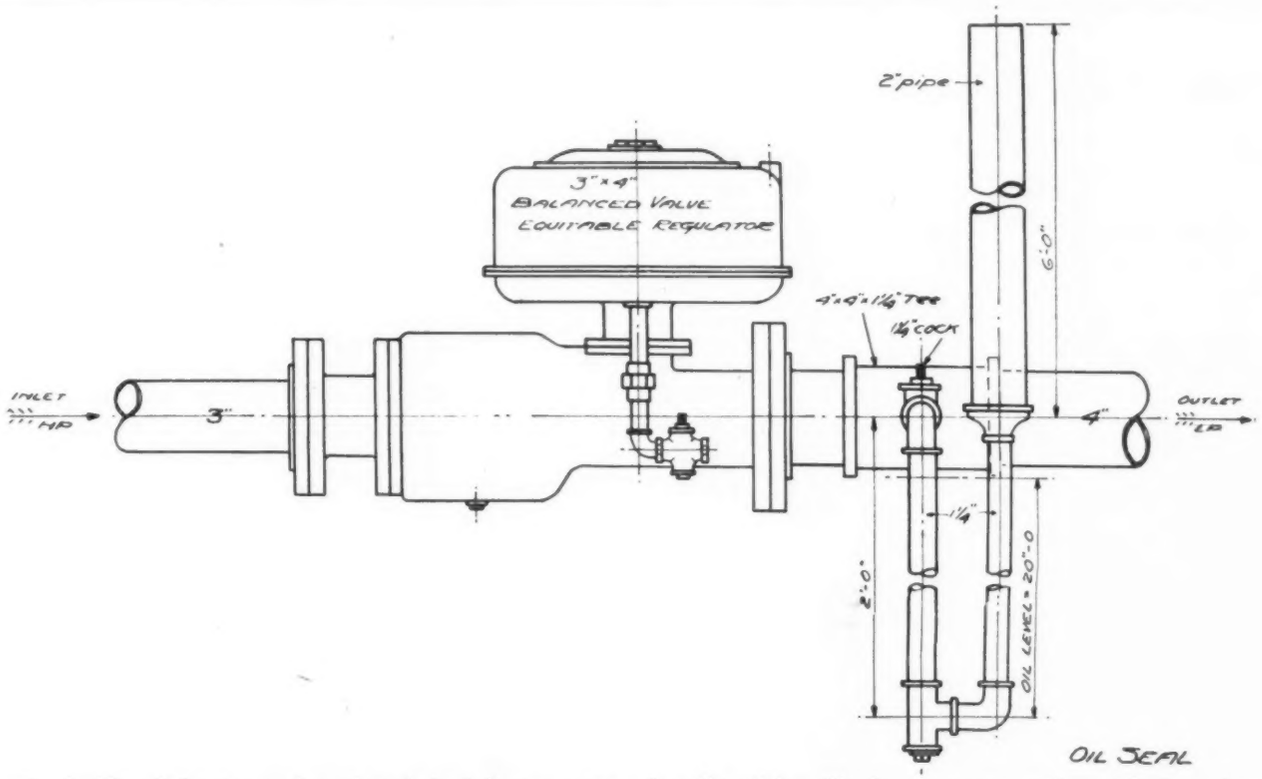
The next essential is the protection of the governor seats against the cutting effect of scale passing with the gas at high velocity. Screens have been used for this purpose with good results. But installations heretofore have not provided practicable means of cleaning same. On the inlet side of the governor a special drip pot is made and installed; the nipple on the governor side is carried through to

GOVERNOR PIT SHOWING INLET OF GOVERNOR WITH POT FOR ACCUMULATION OF FINE DUST ALSO NOTE VALVE ON VERTICAL PIPING.



GAUGE BOX & VENT PIPE

CLOSE-UP VIEW OF RECORDING BOX



the inside of the pot and a thread is left on same. A fine wire-mesh screen, size 80, is then welded to a half socket the same size as the nipple thread. This screen slips through the top of the pot and is easily screwed tight on the nipple. Any scale carried by the gas will strike the screen and fall to the pot. The scale will gather on the screens and require cleaning, but this is easy and is much to be preferred to renewing governor seats. There have been cases where the pots have filled and backed up the line, practically shutting off the gas.

The governor pits are all ventilated by installing a 4-in. W. I. pipe from the pit and carrying it to the curb and fixing a standpipe about 14 ft. high. This will carry off any leaking gas as well as provide for fresh air passing through the pit, as the holes in the manhole cover will permit the air to enter the pit.

It is the practice to install high-pressure and low-pressure gauges at each pit. These for accessibility are installed outside. The piping for the purpose is carried through the 4-in. ventilating pipe. A box for housing the gauge is fixed to the standpipe. It is not essential to place a high-pressure gauge at each pit but provision should be made for same. A low-pressure gauge, however, should be located at each governor location. Provision should be made for collecting the charts from such gauges daily so that knowledge of the proper operation of the governor is always available.

Elevation Above San Francisco Works an Aid to Maintaining Good Pressure

Pressure conditions on the system receive daily attention. Charts are collected each day from different sections—a low-pressure chart from each governor pit, a few high-pressure charts and a chart from six selected locations on the exclusive low-pressure area.

The governors are all set to open at a pressure a little less than 8 in. The low pressure at the works is maintained so as to carry as near as possible this pressure over the system. On account of the elevation of San Francisco above the gas works it is not difficult to maintain good pressure. Care is taken to avoid the governors opening, except at the peaks. High-pressure gas carries a compression cost of about 6 cents per thousand, so the more the low-pressure system is used the better. Pressure carried at the works on the low-pressure boosters is so regulated to control this. At 6 o'clock at night, the hour of peak demand, all the governors are operating and the maximum pressure is carried by the low-pressure boosters. As the load falls off the low pressure, pressure at the works is maintained for a period, this backs up against the governors and insures their closing for the night Seldom do we experience a leaking governor.

Temporizing in Remote Districts

The development of remote residential districts, villa tracts, and new subdivisions with scattered homes has created a field for high-pressure distribution. This class of business can only be handled profitably by such service. The consumers per mile are few and a low-pressure system would necessitate such large mains to maintain pressure that the business would not justify the installation. Such districts as these are piped with 2, 3 or 4 in. wrought iron mains welded joints and carry a pressure of 2 to 5 lbs. This pressure is supplied by high-pressure governors fed by the high-pressure transmission system. The governors are set in manholes, as described, or one of a more temporary type in the curb. This latter practice we have followed in cases where it was planned to later correct the system to low pressure when the development of the territory warranted it. The consumers on these medium-pressure systems are all supplied with gas service through individual regulators. Such regulators are all of the single-diaphragm

single-valve type and known as service regulators. There are many makes on the market all operated on the same principle. Care should be taken in the selection of a regulator as its function is an important one. If it is subject to faults in operation it is in a position to do considerable harm, particularly if it permits high-pressure gas to pass to the house pipe and gas appliances. The latest type regulators are all actuated by a spring in place of adding dead weights. This is an improvement as it allows for fine adjustment. The valve and seat should be accessible and the orifice in the seat adjustable for various inlet pressures. The first is essential for at intervals the regulator valves must be renewed.

Most regulators still retain a dead weight on top of the diaphragm, though spring controlled as to pressure regulation. This weight makes it necessary that the regulator set level and in transit it must be handled with care else the weight will become loose and in time cut the diaphragm. There is one pattern of governor spring-controlled valve with a toggle-joint movement that does not require any weight and can be set in any position in service. This governor is coming into more general use as its features are being recognized.

CAPACITIES OF HIGH PRESSURE GOVERNORS AT VARIOUS INITIAL AND TERMINAL PRESSURES FOR 0.65 GAS GRAVITY

SIZE OF GOV.	INITIAL PRESSURE LBS./SQ. IN. GAUGE	TERMINAL PRESSURE LBS./SQ. IN. GAUGE	DROP IN PRESSURE LBS./SQ. IN. GAUGE	MEAN ABS. PRESSURE LBS./SQ. IN. ABSOLUTE	CU. FEET PER HR.
2"	4	2	3	18.2	54860
2"	4	3	2	18.7	94000
2"	10	2	8	20.7	94992
2"	10	3	7	21.2	89000
2"	10	5	5	22.2	77200
2"	10	7	3	23.2	61200
2"	15	2	13	25.2	127200
2"	15	3	12	23.7	123500
2"	15	5	10	24.7	115000
2"	15	7	8	25.2	105000
2"	15	10	5	27.2	85400
2"	26	2	18	23.7	168000
2"	20	3	17	26.2	154900
2"	20	5	15	27.2	140900
2"	20	7	13	28.2	140200
2"	20	10	10	28.7	123600
2"	40	2	38	35.7	240,000
2"	40	3	37	36.2	268,000
2"	40	5	35	37.2	262,000
2"	40	7	33	38.2	260,000
2"	40	10	30	38.7	230,000
2"	40	20	20	41.7	221,900
2"	60	2	58	45.7	377,600
2"	60	3	57	47.2	374,600
2"	60	10	50	48.2	361,600
2"	60	20	40	34.7	343,400
2"	60	40	20	69.7	264,600
4"	4	2	2	18.2	286,000
4"	5	3	2	18.7	183,000
4"	10	2	8	20.7	386,900
4"	10	3	7	21.2	366,000
4"	10	5	5	22.2	316,900
4"	10	7	3	23.2	250,900
4"	15	2	13	23.2	522,000
4"	15	3	12	23.7	506,000
4"	15	5	10	24.7	472,000
4"	15	7	8	25.2	430,000
4"	15	10	5	27.2	350,000
4"	20	2	18	23.7	696,000
4"	20	3	17	26.2	623,000
4"	20	5	15	27.2	607,900
4"	20	7	13	28.2	574,000
4"	20	10	10	28.7	510,900
4"	40	2	38	35.7	1,110,000
4"	40	3	37	36.2	1,100,000
4"	40	5	35	37.2	1,082,000
4"	40	7	33	38.2	1068,000
4"	40	10	30	38.7	1025,000
4"	40	20	20	41.7	997,000
4"	60	2	58	45.7	1,550,000
4"	60	3	57	47.2	1,530,000
4"	60	10	50	48.2	1410,000
4"	60	20	40	34.7	1408,000
4"	60	40	20	69.7	1022,000

Where two or three pounds pressure are carried on the distribution system there is not any great damage if the governor breaks down. With higher pressure some engineers require protection, such as mercury seals as a part of the regulator in order to release the pressure in case of leaking valves or broken diaphragms. Oil seals have been added to the piping at the regulator outlet for such release. These must be given attention to avoid evaporation of the oil to a point below the pressure. When such a seal blows it is likely to cause considerable mess. To avoid this a design as the sketch illustrates has been adapted. It is not our practice to use seals, as experience has not proven them necessary in the case of domestic consumers. In large industrials where the gas service is supplied from high-pressure mains a seal is essential. Here the load often goes off with the whistle at 12 M. or 5 P. M. The regulators are not given time to seat properly and the pressure will build up on the low side. The type of seal illustrated has proven its value in such case. It is similar to any type oil seal, excepting the expanded long nipple at the top. When the seal blows the oil rises to the expanded nipple the gas blows through and gradually the pressure falls and the oil returns to its normal place.

Vents an Essential

The use of vents on regulators are essential in order that the diaphragms will function. It is also protection in case a diaphragm breaks. It is best to install the regulator in the open air and screw a street ell in the vent opening so as to avoid as much as possible the closing up of the vent hole, by dirt falling in same. Regulators are best located in the open air above ground and close to the meter rather than in a sidewalk box. This practice allows for cheaper construction as the small high-pressure service pipe can be carried to the meter. It also saves the expense of a curb box and cover for the regulator.

On low-pressure systems it is often found necessary to install regulators for individual consumers. Such cases occur where the gas service requires fine adjustment for some particular work, or where the altitude is such that the pressure builds up. In these latter cases where pilot lights are in service a service regulator is essential, else the consumption by the pilot light would be excessive, unless constantly adjusted. The regulator for this purpose is very similar to the high-pressure type service regulator, excepting that the valve area is larger and the diaphragm acts direct on the valve through a piston rather than with a lever.

Wherever a great variation in pressure exists on the distribution system or at the consumer's service it is well to consider the installation of governors or regulators. Individual regulators should only be adopted as a last resort. District control of a uniform pressure is much to be preferred. In California the provision of the public utility general order covering gas service provides for a pressure not to exceed 12 in. or less than 2 in. or 50 per cent of the maximum or minimum pressure registered. This is difficult to comply with unless the distribution system is large and individual regulation may be necessary. It will profit any company to control the pressure and maintain it as low as good service will permit. Actual leakage of gas is thus reduced as well as more accurate registration of meters is obtained.

Advantages of Gas Fuel in the Heat Treatments of Metals

R. G. Logue Would Change Slogan from "Cook with Gas" to "Gas for the Industries"—Advocates Ceasing to Pamper Industrials with Preferential Rates

The use of metals has been intimately associated with civilization from the beginning. Their use, to at least a limited extent, must have been inherent in the human race. In the earliest legends of mythology we read of the heroes, bedecked with armor, riding in emblazoned chariots and conquering their enemies with weapons of the truest metals.

Our early historians and explorers of prehistoric conditions decided that there existed a stone age, at which time metals and their use were unknown. Recent discoveries have proved this belief to be somewhat erroneous, as brass and steel tools have been found embedded in the pyramids of Egypt, constructed nearly four thousand years before Christ.

It is possible that owing to the fact that our ancestors were very superstitious about exploring the mysteries of their universe, that the only metals used were those found in a metallic state on or near the surface of the earth, and as the quantity of such metal was very limited, the ancients turned to stone, flint and other handy materials for the construction of their utensils, explained R. G. Logue in a paper at the recent annual convention of the Pacific Gas Association.

Gold and natural bronze were probably the first metals extensively used. Meteoric iron was no doubt used and probably prized very highly on account of its scarcity.

The first results of heat treating of metals discovered by the ancients was probably bronze, accidentally produced by a mixture of copper and some other metal, coming in contact with volcanic heat, but research has established unquestionably the fact that the races of antiquity developed the art of heat treating of metals in many ways far beyond our present knowledge, and it is unfortunate that many of their most useful secrets have been lost in the cycles of civilization.

We have as evidence, antique specimens of copper and bronze tempered to a state that would permit a fine cutting edge. It was formerly believed that some of the marvelous results which they obtained depended entirely upon the proportion of the mixture, but modern scientists are more and more leaning to the conclusion that the careful method of heat treating was the important factor and metallurgists are very much encouraged with the results obtained in recent experiments along those lines.

Metals and their use have played an important part in all the ages of authentic history. In the early historic times, bronze was the predominant metal and was used to some extent in all parts of the known world. Unquestionably other metals, and especially steel, were used, but owing to the deteriorating effects of the elements on the iron and steel, only a limited number of antique specimens exist to-day.

From Egypt, that secluded country in the valley of the Nile, come the oldest specimens of both brass and iron. Centuries before the Christian era, they were well versed in the use and treatment of those metals.

For fifty centuries, the Egyptians applied themselves secretly in the development of civilization, and it was there that many of our fine arts were cradled, and it was they who first developed the uses and treatment of steel, which has probably been the most important element in the development of civilization during the last three thousand years.

Why Bronze Relics Predominate

The secrets of their art gradually spread from Egypt to Assyria, India, Asia, Greece and to Rome, about one thousand years before Christ, finally permeating the countries of Europe with the rise of the Roman Empire.

Certain localities became very adept in the art of steel making, such as Damascus, where the finest of swords and cutlery were produced. Since the time of Christ, civilization has followed the sword and progress has gone hand in hand with the extensive use and development of metals.

Pliny in the first century writes extensively on the heat treatment of steel and gives us some interesting details relative to its manufacture. The Romans paid particular attention to the manner and quality of heat used and were very particular when tempering steel as to the kind of quenching fluid used. He mentions oil tempering and also tells us that the waters of certain rivers have different intrinsic values in treating certain varieties of iron.

Theophilus in the eleventh century writes on the manufacture of steel and gives some very quaint instructions for hardening. He tells of human blood, the liquid of boiled snails, bean juice and wine being extensively used to produce different degrees of hardness and even to-day we frequently find that some peculiar ideas exist.

All through the middle ages and up to the present time, the civilized peoples of the earth have frantically searched for deposits of metal and have diligently applied themselves to perfecting metal products. The United States occupies a leading position and to-day produces 60 per cent of the world's steel.

The use of fuels in the modern heat treatment of metals is a subject so large and extensive that it necessarily must be discussed in a very general way. There are over fifty metals and several hundred alloys, and volumes have been written on the manufacture of each one

This subject could be treated from the standpoint of a chemist, metallurgist, or fuel engineer but we will only attempt to write from the standpoint of an industrial gas engineer.

Aside from electricity, the fuels competing with gas to-day in the heat treatment of metals are wood, charcoal, peat, coal, coke and oil.

No consumer would use any of the above-mentioned fuels in preference to gas if he was convinced that gas would do his work as well and at no greater cost. The convenience, cleanliness and every-ready supply of gas appeals to every one. It then remains to demonstrate that gas can perform the duty as well, if not better, than solid or liquid fuels, and at a cost that will be fully justified in the general results.

Wood and charcoal are seldom competitors and are generally used in districts where gas is not available and where the fuel is obtained at a minimum or no cost. The objections are so many and apparent compared with gas that they are not worth discussing.

Peat is in somewhat the same category and is only used where better fuels are prohibitive or unobtainable.

Coal and coke are extensively used and it is with that class of users that the gas industry can make its greatest inroads. In the first place the usual objections, such as storage space, dirt, ash, uncertainty of supply and the ease and comfort of the operator prevails against the use of all solid fuels. In the past these arguments have not always been effective, but to-day with the high price and shortage of skilled labor, these elements are more to be reckoned with than ever.

In the early application of gas to metal treating, operators complained that certain results or temperatures could not be obtained with gas furnaces, but to-day this argument does not apply as there is no temperature treatment practised with coal which cannot be obtained with gas.

Use of Oil Limited

The elements demanded to-day by users of metal products are quality and service and the manufacturer of metals must select his fuel with those elements in mind. To obtain perfect results in the treatment of all metals, it is necessary to subject them to temperatures that can be absolutely controlled.

In many operations, heating too quickly or exposing the product to a heat a few degrees too high will destroy the correct result. It is almost impossible to uniformly control furnaces heated with coal or other solid fuels, while modern gas furnaces can be regulated almost to a degree.

The atmosphere in a furnace also has considerable effect upon the results with various metals and on account of the excess air necessary for combustion, the atmosphere in coal-fired furnaces is always oxidizing, while with the use of gas the atmosphere may be changed from oxidizing to reducing at the operator's will.

One item that is very important in the treatment of high-grade steel is the loss of metal by scaling. With the use of coal, scale is produced by oxidization, overheating or by chemical action due to the impurities in the fuel. With the use of gas, this is reduced to a minimum and with careful operation, can be entirely eliminated.

Of course, some of the above objections to coal can be partially eliminated when muffle furnaces are used, but this only applies when the furnace is new or in excellent repair, as after very few operations leaks develop, owing to the severe action of coal heat on the refractory materials in the furnace.

The use of oil is limited in some degree to the districts where it is produced and in many ways is far superior to solid fuels. The temperature in furnaces can be more easily controlled. The labor and comfort of the workman is somewhat better and the fire can be started and stopped instantly and without as much clean up as with coal. But oil also must have large storage space.

Like coal, it is not uniform, contains impurities or residues and the burners and furnace must be given constant attention.

One great objection to the use of oil is the deteriorating effect it has upon the furnace and metals. This is due to the uneven and high-flame temperature together with the oxidizing atmosphere necessary.

At one time the cheapness of oil in local fields recommended it, but to-day on account of the limited supply and its increasing use for traffic and marine purposes, the price in many instances exceeds that of gas.

When price is not considered, oil has not one quality which would recommend its use in preference to gas and when the ideal control, adequate supply and the cleanliness of gas is considered, oil should not be a competitor.

When considering fuels for melting or treating metals, the important elements are heat generating and heat application. In generating it is important that the combustion be uniform. All solid and liquid fuels must be atomized or gasified in the process of combustion. When such fuels are fired directly in a furnace, this process is materially interferred with, owing to impurities in the fuel and constantly changing conditions in the fire box. This results in imperfect or deloyed combustion, entailing a great loss in efficiency, some furnaces operating as low as 15 per cent.

Is it not a public duty to treat such fuels in a plant scientifically constructed for the manufacture of gas, and not only save a great percentage of the loss by conserving the residuals, but deliver to the industrial public a fuel shorn of its impurities, capable of perfect uniform combustion?

In the application there are three different methods of conveying the heat from the point of combustion to the metal; by conduction, convection and radiation.

When it is necessary to heat a metal uniformly through its entire mass, radiant heat seems to be the most effective. This is due to the fact that radiant heat will penetrate farther and faster and with less molecular strain than either convected or conducted heat.

In other operations where the opposite results are required, convected or conducted heat is essential. Gas is the only fuel by which metals can be treated with three different kinds of heat and the desired amount of each kind uniformly regulated.

The physical change effected in a metal with the application of heat is to a great extent, theoretical. All molecules of matter are said to be in motion and when heat is applied the activity and radius of the molecules increases. When cooling takes place, the molecules attempt to resume their former place and motion.

The different results produced by heating and cooling are obtained by setting up a molecular strain in their attempt to assume their natural position. For different results it is necessary that all applications of heat be made in a very specific manner and the cooling must be governed just as carefully.

In Competition with Electricity for Very High Temperatures

We now come to the discussion of electricity. Many

operators are successfully using electric furnaces for special high-temperature work, and many such high temperatures were not until recently attempted by the manufacturers of gas furnaces, but many experiments in the last few years have demonstrated conclusively that gas furnaces can produce heats probably as high as those obtained in electric furnaces.

Some gas men have always been fearful of electric development, but our past experience has proved that electricity has not only made no inroads on the gas industry, but on the other hand has spurred the gas men on to greater development, which in nearly every case has resulted in surpassing the efforts of the electrical engineers.

Unquestionably electricity is one of the greatest gifts to mankind and properly harnessed and mechanically perfected, it no doubt will work wonders in its sphere, but we do not believe it will ever displace gas in metal furnaces. Let us devote our greatest efforts to the building of the most efficient appliances, manufacture the best of commercial gas, give our patrons satisfactory service, and if our electrical competitors can build better furnaces, give better service, produce more excellent results, let them have the business and the world will be better for the effort.

There is one phase of this subject which we believe is most important, and that is the advantages to the gas industry in promoting the sale of metal and other industrial furnaces.

Two of the greatest problems which confront the gas distributor to-day are conservation and peak load.

With a constant drag on our resources, the gas man is finding it difficult to obtain adequate raw material for manufacture. That, together with the ever-increasing cost of material and operation, makes it necessary to use available supplies and conserve to the utmost, the valuable residuals. Here we wish to quote from Roberts Austen's Metallurgy, published by the Associates of the Royal School of Mines, about twenty years ago:

"The use of gaseous fuel in metallurgical operation has effected a great saving in coal; besides this advantage, there are two circumstances that must lead to its more general adoption. These are the possibility of employing inferior fuels and waste products and the high temperatures attainable by the use of such fuels.

"The method of gas firing is, however, still far short of a universal adoption, but it may be predicted that as the subject becomes more widely understood, the examples of any other method of treating fuel will become rare."

This prediction is still in the making and present conditions compel its recognition.

Manufacturing More Residuals

By encouraging the use of industrial gas it will permit the manufacture of more residuals and will in that way stabilize and identify the gas industry more than a mere distributor of gas.

Also in all other industries the problem of obtaining material or finished product is apparent. The present condition of our transportation facilities will probably exist for some time and it will be absolutely necessary for many manufacturers to produce or finish merchandise at home where heretofore they have depended on the large producer in distant parts of the country.

Nearly all of the small industrial concerns locally situated can produce more excellent results with better utilization of material and more satisfactory service than the large distant manufacturer.

For years industries have looked askant at the use of gas for their work. The price seemed prohibitive and it was very hard, even in a small way, to persuade the manufacturers that gas was at all capable of performing their duty.

It has taken a world war to do in two short years what our industry has vainly attempted in the last seventy-five years. Due to the efforts in promoting the war, the eyes of the manufacturing world have been opened; gas was necessarily used, forgetting the cost. It was "Win the war and we are all willing to pay the bills," and we are glad to say that the gas industry played a very important part in winning the war.

The struggle in Europe took a terrible toll and played an awful havoc. Conditions to-day in this country have not reached normal; we are all suffering and still bearing the brunt of this necessary operation of civilization, but are we, as an industry, going to refuse to take advantage of the great opportunities that might be derived from our experiences during the war period?

Thousands of operators have been converted to the use of gas. The satisfactory results obtained with gas have been heralded all over this continent and Europe.

During the war period essential manufacturers demanded gas, and the gas companies necessarily had to devote their entire efforts to the production, and manufacturers in a general way were permitted to use the product with very little assistance in its application, except from the manufacturers of gas appliances.

We have before us to-day the greatest opportunity ever presented to any industry. There are thousands of operators that are loath to change to other fuels and just as many who are willing to begin the use of gas if the proper encouragement is given.

A Different Kind of Industrial Gas Man

In the past the industrial man of the gas company has been in the same class as a solicitor. He was required to take care of the ordinary requests for burners and be able to produce a catalogue of some manufacturer, if an industrial appliance was requested. In most cases he was not a specialist and gas companies seemed to avoid employing men intelligent enough in industrial lines to discuss problems properly with manufacturers.

The time may come too soon when gas companies will have a surplus of product and will again be fighting for business. The time is now to insure ourselves against such a time and be so strongly entrenched with industries that only a national catastrophe could materially hamper our business.

To do this, gas companies must employ high-class, intelligent, educated men. The industrial salesman does not necessarily have to be a chemist or metallurgist, nor know as much about a man's business as he who operates it, but he should have sufficient knowledge to intelligently instruct manufacturers in the first rudiments of gas furnace use.

He must also be competent to converse with intelligent operators of gas furnaces. He must be a specialist in the correct operation of industrial gas appliances Such a man must know the rudiments in the manufacture of various raw products.

It was always necessary, and is more so to-day, that such a man must be well paid. In his line he is expected to know more than the new business manager, more than

the general manager and should be of such a caliber that either or both of these officials would profit by frequent association with him.

The large user of industrial gas in some localities is desired, but more particularly it is essential that the industrial gas man develop the hundreds of small users, especially on their present lines of mains.

Now, regarding peak load: There is hardly any branch of the gas sales but what develops a season's peak load, but the user of an industrial appliance operates it approximately the same time every day in the year. The consumption is ideal, as it permits almost perfect distribution. When larger mains are necessary for industrial users, it means immediate adequate return. It minimizes the thousands of trivial complaints which come from domestic users.

In most cases the small industrial user can be persuaded to pay a reasonable rate for gas, which may be considerably higher than competing fuels.

The practice of permitting a low industrial rate has produced extravagance and wastefulness and the time has come when the price of gas to industries should be such that it will be necessary for them to install highly efficient appliances to permit its use.

There is one obligation which gas manufacturers owe, which is very important, and that is the assistance which should be given to manufacturers of gas industrial appliances. Generally speaking, it has been necessary for those manufacturers, to not only develop and produce their product, but also to sell it to the consumer. About the only assistance given in the past by the gas company has been its willingness to handle the appliance at no cost, or at a loss.

Great strides are now being made by the manufacturers in constructing better appliances and the gas company can fulfill its obligations by more energetically promoting the sales. Industrial appliances should be sold at a profit and if the gas company is unwilling to be enhanced in that way, the industrial salesman would be more than willing to relieve them of that excess profit.

Above all things the practice of encouraging and assisting customers to build over or construct crude inefficient appliances should be stopped. The time of the industrial department should be too valuable to bother with minor details, which are so ably taken care of by manufacturers of industrial furnaces.

In closing, it seems that the time is opportune for the gas industry to select a new slogan. For years we have heralded "Cook with gas" until to-day 99 per cent of the people reading this sign are already cooking with gas or have seen it so often that it ceases to be effective.

We do not for a moment wish to discourage the energetic promotion of gas cooking, lighting or heating, but unquestionably the rock foundation of the gas industry in the future will be along industrial lines.

It would seem that "Gas for industry" or some similar motto emblazoned on our holders and advertised to the world by a concerted effort of our publicity department would produce effective and remunerative results and certainly would be along the lines of progress

A New CO_2 Recorder

The determination of carbonic acid gas in flue gas, which constitutes the most important factor in the control of the combustion process, is in both intermittent and continuous recorders, affected by absorption in strong potash. Recently, however, an instrument has been devised which operates by reason of differences of viscosity and density independent physical properties. In the case of carbon dioxide, while the density is much greater, the viscosity is less, than that of air. Density can be estimated by allowing the CO_2 containing gas to escape through an orifice, while viscosity can be measured in a gas passing through a capillary tube. If the gas passes first through the capillary tube a pressure is set up between the outlet of the capillary and the orifice. When tests are thus made with some standard gas—such as air—and a CO_2 containing gas, the results show that the difference in pressures in the two cases is practically a linear function of the carbonic acid gas content. In making a test two similar sets of apparatus are put in parallel and standard gas and flue gas drawn through by means of a common air-pump. Corrections for temperature and pressure are thus avoided, and the carbon dioxide is recorded by a differential gauge on a chart.

Continuous records and the absence of chemicals constitute the features of the instrument, while for the observed inaccuracy of the instruments ranging from +.1 at 5 per cent CO_2 to —.5 at 20.4 per cent CO_2 and averaging —.15 per cent a counter-balancing allowance can be made on the chart as the error decreases with increasing carbonic acid gas in the range for which the instrument is usually required. The instrument is also applicable for the determination of other gases.

Prohibitive Price of Oxygen Only Obstacle to Its Use for Gas Making Purposes

It seems at the present time desirable to examine carefully all conceivable methods of treating coal for the production of gas fuel with maximum economy. Oxygen, it is urged, should be used in the carbonization of coal-gas production. The heat needed could be generated in the charge itself by the use of a regulated supply of oxygen. The complete gasification of coal might then be attained with the maximum of thermal efficiency. If it were possible to put practically the whole of the nation's coal fuel into gaseous form, an important saving of transport and fuel would be effected. It would have the great advantage of delivering the fuel value of the coal, scarcely impaired, to the consumer.

There are grounds for believing that in the future the price of oxygen will not be an obstacle to its use for gas-making processes. If the oxygen method advocated were technically and commercially feasible, the large consumption by the gas industry would provide conditions conductive to cheap production of oxygen.

Permeability of Rubber to Gases

Scientific paper No. 387, U. S. Bureau of Standards. Paper bound; 10 x 7 in.; 35 pages; illustrated. Obtained from U. S. Bureau of Standards, Washington, D. C.

A discussion of the value of rubber as a containing medium for various kinds of gases as related to pressure, etc., and the theory of permeability, including a summary of the findings for tests carried on for the purpose indicated.

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As the Journal Views It

No Need of Impatience

The accumulated wealth of the average capitalist is a source of considerable needless worry to the average socialist and advocate of equal division of the world's wealth. If he were content to let the course of events adjust things he would inevitably, as the harassed capitalist well knows, accomplish all that he hopes for, and perhaps even more—instead of a mere equal division our frenzied agitator's descendant might even accumulate to himself all that the capitalist left behind, with accumulated interest.

The motive behind the accumulations of the new capitalists who surge upward in every generation is primarily a fear of impoverished old age—then a fear of impoverishment for his offspring. If he could believe that the theories of the equal dividers are sound, they would probably find in him a strong advocate and supporter.

Assurance of a decent living for himself when his vigor has exhausted itself and for his offspring through the generations is all that he seeks in his accumulations, and he well knows, great though they may be, he can never attain.

But equal division theories in practice bring about demoralization of production, and without production the world cannot live.

When the human race learns patience it will have freed itself of a lot of misspent energies.

The socialist and anarchist with all their bombs and wild words will not bring about equal division of wealth. But nature, left to its own workings, will bring it about that transient privileges for a time holding the disproportionate balances will rest not

in the hands of a particular few, but any family may get a chance.

Fortunes are built up merely, in the course of time, to disappear. The names of the great capitalists of to-day are not names that appear in the lists of great capitalists of the past. Nor will they be outstanding names a century hence.

So as to socialism, bolshevism, anarchy and kindred intoxications—what's the use?

The Taste of Cold Weather

The present period of sudden cold weather is an ideal time for gas heaters.

The wood fire in the furnace, morning and evening, doesn't quite suffice. Besides, it involves a great deal of labor and eye-biting smoke.

The steady coal fire is too much and too expensive. One or two gas heaters in the home will meet the needs and be cheaper than any other expedient.

If we have been caught napping by the suddenness of the opportunity and are not ready with the heaters so we may make actual sales, we should, at least, not neglect the situation as an opportunity to do missionary educational work toward actual sales for next year.

The consumer in general is thinking considerably as to how to make his home comfortable at reasonable cost. He is in a receptive mood to absorb the logic of the gas way.

Tracing the Gas Industry's Labor Problem to Its Source

(*Continued from page* 278.)

keep the plant running under all and every circumstance? His is the greater responsibility and this labor problem is only one of the many that he has to solve. That is why he is paid so much more than we are: To assume those responsibilities. If the plant must shut down then his is the greater fault."

"But the usual reason for the refusal of an increase in the gas industry," I told him, " is because the company is financially unable to grant it. This is the case in most companies and surely it is not the fault of the company managers or operators that they are losing money on every foot of gas sold. This condition is caused by the laws under which the properties are operated and by the officials who administer those laws."

"Then the elected officials are responsible for these conditions and they should be made to bear the blame and not allowed to pose before the public as its protectors when in reality they are bringing about just such conditions."

"These laws, too, are often misinterpreted by courts, who, after all, are only human, and are apt to be deceived by the overzealousness of some political self-seeker, with a resultant wrong opinion in regard to the claims of a company."

"All of which," responded this workman, "provides wonderful arguments for the radicals, for they do not hesitate to take just such pleas at this and turn them to their own advantage. I am not in sympathy with radical thought, nor am I a Socialist, but I am convinced that there is something wrong with a system that can be twisted by men in power to their own ends. Those are the ones who are forgetting their responsibility to the public and who are the cause of the unrest that is sweeping the country as a whole. Maybe the connection is not as clearly established in other industries as in the gas field, but, nevertheless, it can be traced back to its source and as in the case of the laws it is misinterpreted."

Who can say this man is wrong? Who can declare that according to his own lights he is illogical? He does not state a solution of the problem as such but there is much that can be read between the lines and it is just possible that he has worked out in his own mind a course of reasoning that may lead to great things. The writer does not venture an opinion.

Retorting Coal Gas Using Waste Gases from Water-Gas Run

The method of adding water gas to rich coal gas is well known and much practised. A mixture of the two gases made simultaneously in a combined plant is termed di-gas, and this method is in use in some works in Continental Europe. Water gas is a two-stage operation, and the waste gases from the run are utilized to externally heat the retort. No mechanical separation of the producer and retort is necessary, as careful control over the pressures in the two parts of the plant serve to effectively prevent the waste gases during the blow from intermixing with the gas resulting from carbonization.

In a plant operating at Graz an overall efficiency of 68.5 per cent is obtained, of which 60.2 per cent is in the form of gas and 8.3 per cent as tar, and a saving of 20 per cent fuel is said to be thus attained. The tar is of low temperature type and represents 80 per cent of the quantity obtained in laboratory experiments, while 53 per cent of the total nitrogen is obtained as ammonia.

U. S. Government Representative Will Address South Central Gas Association Convention

E. G. Sievers, of the Division of Mineral Resources, Washington, D. C., will deliver an illustrated talk on "The Natural Gas Industry in the United States," at the annual convention of the South Central Gas Association to be held in Dallas, Oct. 12-14. This address will include a discussion on the history and development, production, utilization and economic aspects. It will contain statistics to show the development of the industry as far back as any data are available. Under utilization is included the consumption of gas for domestic, industrial, manufacturing and miscellaneous purposes with actual figures to show distribution. Comparison with other fuels will be made. There will be approximately twenty-five diagrams (in the form of lantern slides) illustrating the facts in the paper and emphasizing the outstanding features of the industry.

Developing the Field for Gas in Domestic and Commercial Heating

C. M. Grow Lacks Not Optimism as to Benefiting Consumer by Selling Him Gas for Such Purposes—Some of the Accomplishments that Have Been Achieved

The appliance salesman knows that every person along the gas company's mains who is using oil, distillate, coal or wood for any purpose whatever is a prospect. Assuming that a district has been properly charted and the salesman is fully advised of the places where fuel other than gas is being used, it is obvious that a certain responsibility or duty rests upon the salesman to suggest the most practical and economical method of using gas for each particular purpose, declared C. M. Grow in a paper read before the twenty-seventh annual convention of the Pacific Coast Gas Association at Portland, Ore., Sept. 21-24, 1920.

In an exclusive district where the home is owned by the occupant, it is well to endeavor to obtain the highest refinement in house heating and the salesman should propose the installation of a gas-fired hot-water heating system with automatic temperature control.

If, on the other hand, he is called upon to suggest a plan of heating a similar home in another district and occupied by a tenant who has been using a coal and wood furnace, then suggest a gas furnace.

The appliance salesman knows that to operate a gas burner in the coal furnace will require about 200 cu. ft. per hour, which at a 60-cent rate would be 12 cents per hour, and that a gas furnace designed and built for the use of gas will require about 100 cu. ft. of gas at a cost of 6 cents per hour. Based on a monthly consumption of 30,000 cu. ft. of gas in a converted wood and coal furnace, there would be a difference of $9 per month saving in favor of the gas furnace.

Where the Promise Must End

The appliance salesman is not justified, however, in making the statement that the gas furnace will pay for itself the first year or in any given length of time, but he may make the forceful argument that a saving of $9 per month is big interest on the added investment required to put in a gas furnace rather than a furnace burner in the old coal furnace, besides the general satisfaction of knowing that he is to get a maximum amount of heat at a minimum cost. I will make this encouraging statement to the gas furnace salesman—that after you reach a certain per cent of saturation of gas furnaces in a district you have very few calls or demands for furnace burners.

In my experience in heating large residences, twelve rooms and up, with hot-air furnaces I have found all kinds of devices in the cold-air ducts, such as desk fans and other types of fans intended to hasten the air action. With all due regard to local furnace builders, it has been my practice to select an Eastern-built furnace having a hot-air travel of 40 ft. or more, burner to stack, and guaranteed to raise the air temperature of 50,000 cu. ft. from 0 to 70 deg. in one hour. Having selected the right furnace, cut out all fans, eliminate the cold-air duct, take the cold air from the basement which is usually fresh and clean and turn your attention to the control of the temperature in the rooms to be heated. There are four styles of control—the lift valve, which gives full heat or half heat, the thermostatic which is intended to keep the rooms at a constant temperature, the electric or push-button control, and the graduating hand control. The latter not being a snap acting valve can only be used safely on a burner that will not back fire.

Water Heating

The instantaneous heater will no doubt continue in use in cottages and residences. There is a strong growing demand for the storage automatic water heating system as distinguished from the automatic instantaneous. The gas company will favor the storage heater for the reason that it is minimum in size rather than maximum. The maximum demand of 1,000 storage heaters is far less than that of 1,000 instantaneous heaters. The storage heater delivers the water at the faucet at city pressure and at a uniform temperature. This is especially noticeable where a home is equipped with several baths and where several hot-water faucets are operating at one time.

Hotel and Apartment-House Service

In many cases—in fact, in most cases—the appliance salesman is called upon to make the most of conditions as he finds them. His business is primarily that of selling gas. When he arrives at the boiler room of an apartment house he finds a steam boiler and auxiliary water heater in operation and fired with distillate or with crude oil. His first impulse should be to throw out both pieces of apparatus and install a sectional gas-fired water heater with snap acting moment valve in the storage tank and a low-pressure sectional gas-fired steam boiler. A more detailed study of the apparatus and of all of the conditions, particularly if the consumer is the tenant and not the owner of the property may emphasize the advisability of converting part or all of the present apparatus to the use of gas.

Having already gone on record as favoring the installation of gas-fired equipment of the greatest refinement, I am now going to describe briefly a few installations which we have made along the lines of converting the consumer's present equipment to the use of gas.

Steam Heating

Practically every apartment house built prior to 1915 is equipped with a low-pressure sectional steam boiler designed and built for the use of coal. These boilers were equipped when installed with either distillate burners or with motor driven crude oil burners. Our first gas installations in these boilers consisted of a manifold and four 1¼ atmospheric burners in the upper door, throwing the flame down onto a bridge wall. With 515 B.t.u. gas at 60 cents, we could compete with distillate at 8 cents per gallon. The boilers required from 350 to 950 cu. ft. of gas per hour according to size, with now

and then a larger boiler. Later on we adopted the plan of installing the burners through the draft door at the bottom of the fire box, two of the nipples being 16 in. long and the rear burners 30 in. long, by heating the nipples and bending same and upsetting the burner nozzle we directed the flame toward the sections. By this method we could compete with distillate at 5½ cents per gallon. We still found it difficult to compete with certain types of motor-driven crude-oil burners with oil at $1.50 per barrel. A third and very efficient method of firing a boiler of this type is to build a brick wall on either side of the combustion chamber full length and 6 in. out from the face of the sections and across the rear end. On top of these walls place a series of flat cast iron rectangular stove burners located 14 in. below the crown of the sections and with the gas fed from below, using a pilot light and the usual steam regulator in the main gas line. This arrangement overcomes the terrific stack draft and brings the heated gases in contact with the entire surface of the boiler sections.

The appliance salesman should know the value and possibilities of the different styles of oil burners. Furthermore he should not underrate the possibilities of certain oil burners and where it is apparent that a heavy stack loss will be unfavorable to gas, he should redouble his efforts and sell a gas-fired sectional boiler which carries with it a guarantee to put 80 per cent of the heat contained in the gas into the water.

In the matter of heating water and of heating an apartment or office building with gas, I wish to impress upon you that in my experience it is not at all times necessary to beat the cost of the previous fuel.

The salesman should paint a word picture of the combined advantages of gas as a fuel, of hot water at all times, day and night, under city pressure, always at a uniform temperatnre, snapping out at the faucet at just the temperature the consumer wants, never getting too hot and thereby wasting fuel and ruining all of the gaskets in the house plumbing, never getting cold or tepid, always right, in fact hotel service at all hours. Furthermore, that the apparatus is fool proof and automatic, requiring no attention whatever. It is unnecessary to mention the constant attention required by the old oil burner, the constant repairs, the oil and muck over the basement floor and the added cost of janitors who claim to be experts in operating oil burners. The prospective consumer knows all of these points, and knows them well.

Steam Boilers

Where 10 to 30 horsepower tubular boiler is used intermittently or not over ten hours per day it is practical to equip it with gas burners on a domestic rate, not because it will be a direct saving in gas over oil as a fuel but for the reason that the facility of starting up from a cold stand quickly, no steam being required for atomizing, better regulation, smaller stack losses, better stack regulation, and especially by reason of the small amount of attention required by the gas burners as compared with the oil burners. Even though a licensed engineer may be required by ordinance, the said engineer can be used in other capacities rather than occupying a seat in the boiler room. Small vertical boilers up to 5 horsepower are a fertile field for burners and automatic steam controls. A large, single unit, cast iron drilled burner is best adapted to the vertical high-pressure boiler for the reason that almost perfect combustion can be obtained by proper adjustment of air and gas. Always recommend and sell a vertical boiler designed for the use of gas and having one hundred or more one-inch flues, rather than the old type boiler having two-inch tubes. By initiating and installing a practical and thoroughly successful thermostatic or temperature control you have given the consumer the real service and incidentally you have eliminated all necessity for competing with the actual cost of fuel oil, for though the prospective consumer may not realize it, we know from the experience of those who are enjoying automatic gas-fired apparatus that once used it is indispensable.

It is needless to say that no blunders should be made in selecting and in using the sort of burners that are suitable for automatic regulation and control. Thermostatic control properly exemplified and skillfully executed is the sure and certain path to success for the industrial department. By the use of it we give the consumer:

Hot water at all times at exactly the temperature he wishes, a perfect regulation of the temperature in his home, in his office, or in the factory.

Intelligent regulation of temperature in bake ovens, furnaces and core ovens.

Steam regulation in boilers, both high and low pressure.

Dependable temperature regulation in incubator houses and in brooder houses.

Uniform control of temperature of liquids of all kinds, and of molten metal up to 800 deg.

Bake Ovens

There is not a bakery on the lines of the Southern California Gas Company using any fuel other than gas. Three years ago we did not have a single installation. We have originated and put into use a double-swing low-pressure bake-oven burner that operates on 3-in. pressure and heats the usual 9x13 dutch oven in one hour, consuming 550 cu. ft. of gas. This burner is simple, being made up of pipe and fittings. The burner consists of three elements, each with double air mixer and controlled by a ½-in. lever cock. The flame of one element is 16 in.; the second element when lighted adds 16 in. to the flame, and the third brings the total flame to 48 in. without the expense of a motor and blower. In rare instances where the pressure is below 6 in. water column we install the usual motor driven burner.

The principal involved in heating a dutch oven is that of heating the interior surface of oven which is later actually used for baking the bread or pastry. This is accomplished by using a long flame which can be swung from side to side and to the center. After an hour's firing the oven is closed and allowed to ripen to a uniform temperature. The oven is then loaded and the bread is baked on a receding heat. As distinguished from this process the continuous baking oven is fired constantly from a furnace at the floor line, the heat passing to the rear and over the top and sides to the stack, the baking area being heated by indirect heat. When this oven is brought to the required temperature the oven is loaded with a large quantity of cold dough and care must be taken to have a reserve burner capacity sufficient to tide over the critical moment, otherwise the installation will be regarded as a failure. This sort of furnace may be fired by four 1¼ low-pressure atmospheric burners or one 3-in. patent burner, having three valves. A maximum gas consumption of 900 cu. ft. should be provided for this furnace and the average consumption will be 400 cu. ft.

At the Rosslyn Hotel, Los An-

geles, we have an interesting installation of low-pressure gas burner, using 800 B.t.u. gas on a commercial rate. In this 300-horsepower boiler we have installed four burners, one in each fire door. The burner consists of a battery of nineteen 1¼-in. urner tubes tapped into a large hollow casting and terminating in a cast iron mixing plate. Each tube is provided with primary air and secondary air is passed through the burner by means of large adjustable shutters on the side of the burner, a draft gauge is installed which indicates stack conditions. With these four burners operating with a gas pressure of 6 in., we are developing 400 horsepower with 800 B.t.u. gas and in competition with oil at $2.12 per barrel of 42 gal. Theoretically, it would require 7,600 cu. ft. of gas to do the work of one barrel of oil. In practice we have obtained a higher per cent of efficiency than the previous fuel, and we have taken advantage of every possible means of saving in stack losses, in burner regulation and in atomizing losses. This steam is being used to operate electric generators, steam engines and compressors.

At the Sixth Street Chocolate Shop, Los Angeles, we installed a gas-fired sectional cast-iron boiler, connected to their old storage tank, and a similar steam unit for heating the four floors. We also installed a system of individual burners in the steam table, dish washer and coffee urns. The water and steam boilers being automatic require practically no attention. This change was made in January, 1919. Previous to this the Chocolate Shop was using high-pressure steam and they saved nearly $2,000 in operating cost and the gas company's revenue has been increased $2,400.

A careful study of operating conditions in the boiler room of nearly every hotel and large cafe will convince the experienced gas man that the tail is wagging the dog. Large high-pressure boilers are being operated both summer and winter simply for the reason that high-pressure steam is required for a steam table and the dish washer, and a reducing valve is found in the steam line to lower the pressure to five pounds for heating the building. By installing a gas-fired sectional water boiler connected to the storage tank and putting in a few individual gas burners under the steam table andcoffee urns, these large boilers may be shut down during a period of at least seven months in the year, and an enormous saving is accomplished.

In the Hotel Reynolds at Riverside, Cal., a 200-horsepower boiler has been operated constantly summer and winter for the reason that steam was required for a steam table and a 10-horsepower steam engine used for driving an ice machine. We recommended fifteen-section cast-iron gas-fired sectional water boiler with thermostat, a 10-horsepower gas engine and ten individual gas burners. The saving will be around $2,400 per year.

Referring briefly to a few other installations:

At the American Agar Plant, Los Angeles, we installed a seventeen-section cast-iron sectional gas-fired water boiler, together with one 865-gal. storage tank and four 600-gal. kettles. A snap acting moment valve and thermostat tapped in the center of the horizontal storage tank insures an even temperature of 180 deg. Fahr. at all times. Each kettle is equipped with a thermostatic tube and graduating valve which controls the flow of gas to a triple ring burner and holds the temperature of the liquid in the kettle at 208 deg. Fahr.

In this interesting plant, a high-grade vegetable gelatine is manufactured from sea moss gathered from the rocks in the Pacific Ocean at points between Monterey and Santa Barbara. It is the only plant of its kind in America and although it has been in operation less than a year, it is turning out gelatine in large commercial quantities and finding a ready sale. Gelatine has previously been made from animal matter.

At the L. A. Basket Company plant, we have a series of rectangular cast-iron drilled burners under a kettle containing 5,000 lb. of molten lead. Submerged in this liquid mass is a special thermostatic tube filled with carbonic acid gas which with a graduating valve holds the temperature of the metal at 762 deg. Fahr. in spite of the fact that strips of copper of variable number and weight are constantly passed through the mass of heated metal. A temperature change of two degrees as shown by an indicating gauge will cause the graduating valve to act on the main flow of gas.

The Burbank Sorghum Furnace required two distinctly different types of burner. The furnace is about fifty feet in length and resembles the point of a spear. The two initial trays termed the defecators are at the left and at the right, and are fired by two 12x24 cast-iron drilled stove burners, having a separate stack from the main fire furnace. The balance of this furnace consists of a long narrow fire channel about 40 ft. in length and 4 ft. wide. This is fired by a 5-in. patent atmospheric burner having three valves and air-adjusting apparatus. The stack is only 30 ft. high. In operation the fire travels through this channel in a visible flame nearly the entire distance and starting from a cold stand will cause the second pan to boil in sixteen minutes and one additional pan will boil at intervals of four minutes. The entire string of ten kettles will be in action in less than one hour and the process of boiling is kept up as the mass of preheated juices passes from the defecators into the long line of trays and out to the edge of San Fernando Boulevard where it is snapped up by passing autoists as a finished product at so much per gallon. Incidentally these burners are operating on a pressure of 9 in. The 12x24 burners consume 280 cu. ft. each and the 5-in. burner 1,300 cu. ft. per hour.

The Master Carburetor Foundry is equipped with 3-in. motor-driven blowers taking the gas in at low pressure through a 1-in. connection. The gas consumption required to take off a single heat is 810 cu. ft. 815 B.t.u. gas. The amount of crude oil necessary to do the same work would be 11 gal.

The paint and varnish plants of Los Angeles all use gas exclusively, the popular burner being the 26-in. 3-ring drilled burner installed below the floor line, permitting the kettles to be run over the furnace on a steel track.

At James J. Jeffries' ranch and dairy we found an electric range supplying food to a mess table of fifteen plates. The "juice" bill ran around $600 per year. We installed a club-house range, a multiple coil storage system, converted a furnace and installed burners in the steam boiler in the separator house. The gas bill for all purposes is within the previous cost of electricity.

At Jack Doyle's Stag Cafe we found a French range fired by distillate, and a 100-gal. storage tank. After a brief conversation there were two expressive words uttered—Jack said "shoot" and the salesman, pointing at the dotted line, said "here." We removed the water coils from the range, installed gas burners in the fire box, raised the tank and placed it in a horizontal position on metal stands, tapped in a snap act-

ing moment valve in the center of the tank and connected a 100-gal. multiple coil storage heater, covering the tank with asbestos. Jack is now getting real service and is saving money as well.

In our exclusive Wilshire district is a splendid home of sixteen rooms, with five baths, in which gas was being used in the basement only for the purpose of heating the laundry irons. The consumer's account showed that over a period of ten years the consumption of gas was less than $7 per year. In the kitchen was an immense French coal range and in the basement a huge coal furnace with 14-in. hot-air lines. We recommended and installed a gas-fired range with one-half steel top and special broiler on one end, a 200-gal. multiple-coil automatic storage hot-water system and a 54-in. gas furnace, having a fire travel of 40 ft. In connection with this furnace we installed an automatic temperature regulating device which can be set at any point from 50 to 100 deg. by simply moving a pointer on a thermometer placed at a convenient place in the dining room. Left alone, this device will hold the temperature of the rooms at an even temperature. In practice, however, they press a button at 10 o'clock in the evening, which closes the main flow of gas to the furnace and the same is snapped on again automatically at 5 o'clock in the morning. This regulating apparatus has never failed to function perfectly and is highly satisfactory.

There is a certain satisfaction in developing an account so that the money is spent by one check, instead of one check to the gas company and the other to the coal or oil company. It is an important part of the game to make two blades of grass grow where but one grew before.

Although furnace heating is highly important, it is restricted to the few winter months, whereas the smaller unit, the house heater is quite generally used at least twice a day over a period of about eight months.

House heating by gas bounded into prominence by the advent of a magical gas heater recently developed by one of our leading gas appliance concerns, this radiant heater having a special adaptability to the fire-place. From time immemorial, the American family has gathered about the hearth. Here in the radiant glow of the open grate troths are plighted and the gravest questions are weighed and settled even affecting State and Nation. True to this traditional love of the fireside comfort, all homes are equipped almost without exception with one or more mantles or fire-places. A marked change in fuel conitidons of recent years has made it impracticable and inconvenient to use these mantles with the result that through the length and breadth of our land, there are thousands and even millions of fire-places untouched and unused. Like a flash of lightning out of a clear sky comes this new and wonderful discovery with a radiant heat that rivals the sun itself. Evolved as it was in a shop and laboratory in our own land, built from material mined from the lava beds of the ages, and as if to give it the hallowed touch of antiquity, finished in antique brass and statuary bronze. Like "Old Allen's harp of the North," the millions of idle instruments of comfort are springing back into usefulness and the firesides are once more aglow. The formality of placing these heaters is a pleasure, not a duty. Does the salesman try to sell these heaters. He does not. He brings it forth as his choicest trophy and offers it to the queen of the household as a beautiful and artistic home furnishing DeLux and invariably it sells itself.

U. G. I. Loses $66,763 a Year by Gas Wastage on City Streets

More than $60,000 is wasted annually by gas lamps of the city's street lighting system burning needlessly in the hours before and after dark.

According to the Bureau of Street Lighting, the average working period of the Philadelphia, Pa., gas lights is eleven hours in each twenty-four. Of this period they are needed only nine hours, the rest of the time being wasted while the lamp lighters make their rounds.

As there are 25,500 gas street lamps in the city, each one burning 14,400 cu. ft. of gas in a year, with gas costing the United Gas Improvement Company $1 per thousand cubic feet, the total cost of lighting the city by gas for one year figures out at $367,200 for gas consumed. The waste is represented by two-elevenths of this, or $66,763.63.

A. M. Bible, chief of the Bureau of Street Lighting, states that the "human element"—the gas lighter—is to blame for this wastage. Samuel T. Bodine, president of the United Gas Improvement Company, also expressed this opinion:

"The gas lighter is affected by labor unrest just as any other workman." Mr. Bible said to-day. "We have known men to quit without notice, throwing their torch and ladder into a vacant lot and vanishing, leaving the lights on their beat turned on fully in broad daylight.

"Of course this does not entirely account for the lights in various sections burning while it is light. But lamplighters do leave almost daily. They are a shifting force. Those that remain often have long and difficult routes to cover, which takes such a long time that day is here before they have all the lamps extinguished.

"Similarly in the evening, the man must start out early to light the lamps if he is to have every one on his route lit by nightfall. I would say that the sum of the time during which the lights burn needlessly because of this, in the evening and early morning, is two hours a day."

Mr. Bodine said that the question was particularly vital to his company.

"The gas costs us a dollar for every thousand cubic feet produced," he said. "There is no way we know of eliminating the waste of gas in the early evening and morning.

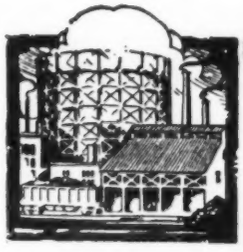
"We once considered installing a miniature clock on each lamp that would turn the gas on and off at set hours, but the first cost would be too prohibitive for present conditions, and the device also requires a pilot light to be kept burning all the time, which would consume a noticeable amount of gas itself.

"I understand that Charleston, S. C., has a system whereby it starts to turn on the lights at dark, and starts extinguishing them before dawn, but this system could not be used here, as the sections left in darkness would furnish a paradise for criminals.

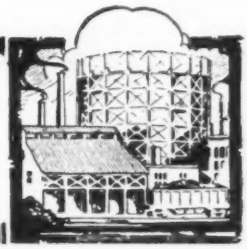
"I do not see how this waste could be remedied unless we increase the number of gas-lighters, and that simply means increase in wages paid out, which would probably more than counterbalance the saving in gas."

The possibility of an installation throughout the city of electric gas lighters, similar to those used in dwellings, was scouted by an electrical expert, who pointed out that the cost would be prohibitive despite the advantage of being able to turn the lights on and off from a central station, as with electric lighters.

And so the gas goes to waste—and it represents 2½ per cent of the estimated operating loss on the Philadelphia gas works of the U. G. I. for 1920.



NEWS OF THE GAS INDUSTRY



Philip H. Gadsden Explains Change in Gas Standard to U. G. I. Employees

Necessity of Fully Informing Employees So that They May Handle Complaints Intelligently

In connection with the change in standard of 22 candle power to 530 B.t.u. in the city of Philadelphia, the United Gas Improvement Company recognized the need for fully informing its employees of what was to be done so that they might be able to handle any complaints of impairment in service which might originate as the result of the reduction in value, or which might be ascribed to such a reduction even though due to no other conditions than those which would be encountered in the ordinary conduct of the business.

It was arranged for one of the vice-presidents of the company, P. H. Gadsden, to visit the various branches and shops and to explain frankly to the men the position of the company, the reason for the proposed reduction and the results which were expected to follow them.

Mr. Gadsden's address follows:

"I am very glad to have this opportunity of meeting you and getting in personal touch with you. Within the last year or more I have been one of the vice-presidents of the United Gas Improvement Company. Prior to that time I spent my life in Charleston, S. C., as president of the Railway, Gas & Electric Company. Charleston is a small city, and I knew every man in the company. I suppose for a period of ten years there was not a man whom I did not know by his first name. So that coming up here to a big company where people do not know each other, or come in contact, is rather a strange sensation. I am accustomed to just a small family. Therefore, I have very greatly appreciated the opportunity which this occasion affords of getting in personal contact with the people in the company who really do the work.

"Now, I want to talk to you on a very important subject, that is, the change of standard which has been authorized by the city council and put into effect by us. I first want to discuss what is the reason for the change; why it was necessary, after operating in Philadelphia on a 22 candle power standard for over twenty-two years, for us to go to councils and ask permission to suspend that standard and substitute another. Then I want to discuss with you what the effect of that change is going to be on the service to the consumer. Next, what will be the effect upon the consumers' bills. Lastly, I want to impress upon you how essential it is that this change, which at present is a temporary one, be made permanent.

"What is the reason for this change which we are going to discuss? You have all doubtless read in the newspapers the criticisms, comments and discussions in councils as to the advisability and necessity of substituting a B.t.u. standard for a candle-power standard. Now, what that means is that up to this time we have been selling gas on a candle-power standard. That is, we have been selling it for its qualities of illumination. We have asked to suspend the candle-power standard and substitute in its place the B.t.u., which in ordinary English means a heating standard. Now, why was it necessary? When this company was organized—when other gas companies generally throughout the United States began business—twenty or thirty years ago—the gas oil which they used to enrich the gas, to bring up the candle power, was a drug on the market. It was a by-product of the refining process of the oil companies who made gasoline and kerosene, and among other things this gas oil was left as a residue, and there was no market for it. Practically no use had been found for it until the water-gas processes were started, so that the water-gas companies, like ourselves, were enabled to contract for and purchase this gas oil in any quantity they wanted and make contracts for any length of time they desired. Now owing to the extraordinary increase in the automobile business and the demand for gasoline, which has grown by leaps and bounds, the price has soared and has forced upon the oil companies the necessity of improving their process of refinement in order to get more and more gasoline out of these residues, which formerly they had to find a market for. The result is that to-day they are extracting from the gas oil, which we use, more and more gasoline. The effect of this has been twofold: First, to shoot up the price of gas oil, and second, to make it very difficult to secure it. There has been, ever since the first of January, a great shortage of gas oil in this country. The situation became so acute early in the spring that an emergency meeting of the gas men of the United States was called in New York under the auspices of the American Gas Association to exchange experiences on this situation and to try to devise some method of meeting it.

"That meeting organized the committee known as the emergency committee of the American Gas Association, composed of executives of gas companies of the United States, and I was made chairman of the committee. So, in discussing this matter with you, I am discussing it not only from the standpoint of a vice-president of this company, but as chairman of a committee representing all the gas companies in the United States, and the facts I shall give you are the facts our committee has secured from the industry at large.

"It developed at that meeting in New York that Philadelphia and New York were the only cities left in the United States which required so high a candle-power standard as twenty-two. Now, in order that you may understand the effect of that, I say to you that the higher the candle power the more gas oil it takes to produce the required standard. Philadelphia and New York, being practically the two largest consumers

of gas in this country, at the same time required a twenty-two candle-power standard, and it was called to the attention of the meeting that if Philadelphia and New York would conform their standards to standards obtaining elsewhere, that is, suspend the candle power and get down to a B.t.u. basis, without any appreciable effect on their service to the consumers, enough gas oil would be saved by them alone to run all the gas plants in New England.

"When you realize that these gas men had gone there fearing that next winter they were going to run out of oil and be put out of business, you can appreciate what they felt with reference to New York and Philadelphia: these two cities to all intents and purposes were taking the oil they wanted and throwing it into the sewer.

"A resolution was passed instructing my committee to bring the matter to the attention of the mayors and councils of New York and Philadelphia, and to urge them in the interest of the gas companies of the United States, and better still, in the interest of the gas consumers of the United States, to suspend this candle-power sandard in New York and Philadelphia and allow their companies to operate on a B.t.u. standard to save the oil.

"When I tell you that on more than one occasion last winter and spring this company was within four or five days of being out of oil, you will realize the urgency of this situation. We were within four or five days on three or four occasions of having no oil to make gas. In other words, of being out of business. Already there have been plants small plants, it is true, but they are naturally the first to suffer, which have had to shut down for want of oil. One of the big plants over in Brooklyn came within, I think, seven hours last winter of having to shut down from that cause. So that this is a real emergency. It is not a question confined solely to the interest of the gas companies; it is a movement inaugurated in the highest interest of the consumer himself, and we gas people realize that our duty is to call the attention of the American people to this situation, so that if disaster should come this winter, notwithstanding all our committee is doing, and gas companies are unable to secure the necessary quantity of gas oil, we shall have performed our duty to the public.

"Now, that is the reason that we have gone before the mayor and council, and I am glad to say that we have received prompt and ready response.

"What is going to be the effect of this change on the service? There is a good deal of apprehension on that subject, not only on the part of the consuming public, but on the part of gas men. The natural inference is that if we make a radical change in our service something is going to happen. The first thing I want to say to you is that nothing of importance is going to happen, so far as we know. We are not making an untried experiment. We are not going into any new fields. What we are doing in Philadelphia has been done in numbers of cities throughout the United States for a year or two, and we have the experience of those companies to guide us. We know exactly what did happen in those places, and based upon their experience, I want to say to you that so far as we can see there is not going to be any appreciable effect on the service. Why do I say that? In the State of Massachusetts this change was made on the first of January, 1918, over two and a half years ago. They were authorized by the commission to suspend the candle-power standard and get down to a B.t.u. standard of 525, which is five points lower than we expect to go at present. That has been in force in Massachusetts all this time, over two and a half years. We have the reports of the gas companies all through that State, and they are unanimous on the point that they have had no serious trouble with their consumers; that there has been no serious effect upon the service, and that the change was brought about without disturbing the harmonious and pleasant relations which should exist between a company and its consumers.

"In the Dominion of Canada—all through the Dominion—the standard is 450 B.t.u., which is 80 B.t.u. lower than the standard which we propose for the present to put into effect. Now that has been in effect since the first of November of last year. At a meeting of gas men in New York I heard the president of the Toronto Gas Company give his experience to his fellow gas men in executive session, and he told them that his experience had been just as I described to you—that the change had been brought about without any appreciable effect upon the service.

"Now, let us bring that illustration closer home. Some of you may know that out on the main line for some time, due to the shortage of the oil supply, we were forced to supply a gas of about 525 B.t.u. We, ourselves, put that change into effect on the main line, so that we know what the experience has been there, and I can best describe it to you by telling you what Mr. Schaefer, one of our men, said at one of the meetings I addressed recently—that he lived out in that territory and used that gas, and he told the men that he did not have to touch a single burner or appliance in his house. Take right here in Philadelphia, up to about a year ago, I believe it was, we were supplying gas of twenty-two candle power and a B.t.u. value of about 635 to 640. Before we made this last change we were running on a basis of about seventeen and one-half candles and 585 to 590 B.t.u. So that right here in this city we had made a reduction of candles of about four, and a B.t.u. reduction of about 50. You can best decide whether there was any trouble with the service, or whether there was any unusual number of complaints.

"Ever since Aug. 15 we started to put into effect this standard which councils authorized. We were then running on a basis of about 585 to 590. We have been gradually reducing that until we are down to about 550. We have been watching with the greatest care and interest to see what the effect would be—to see what the number of complaints would be from day to day—and the character of them. Not only those officers of the company whose immediate duty it has been to look after the subject have been giving it their attention, but I have personally had a report made every morning of the number of complaints in the entire system, so that I know exactly what is going on. You know what is happening in this district, and I can say to you that the same thing is happening all over the city of Philadelphia. There has been no inconvenience caused the consumers and there has been no interference with the service. A relatively few complaints of popping, or firing back, have been received, and they were immediately remedied by an adjustment of the air shutters.

"Now, so far as the effect of this change upon the candle power goes, we, of course, admit that where the gas is still being used in the flat flame burner for illuminating purposes, if we reduce the candle power it is going to effect the illuminating quality, but that situation is met by the sale of the 'Thrift' burners at

15 cents, and the reduced consumption of gas with that burner will more than offset the 15 cents cost of it. Now, so far as all other lights are concerned, when a mantle is used, the service will actually improve under these new conditions, for the reason that with the mantle the illumination comes from the heating value of the gas as applied to the mantle; it does not come from the illuminating qualities of the gas. It is the incandescent mantle which gives the light that is caused by the heat, so as a matter of fact in reducing the candle power of the gas, we appreciably reduce those elements of the gas which carbonize the mantle and give so much trouble. So far as the use of gas with the mantle is concerned, the service is going to be actually better than before. Now, when I say that, I do not want to be misunderstood as claiming that there are not going to be any cases which require our attention, or burners which require adjustment, for, of course, there are going to be in every district, certain appliances which will need readjustment, but they will be relatively few in number.

"In order that the company will not be placed in the position of requiring the consumer to pay for the adjustment of the burner, when the adjustment is made necessary by something the company itself has done, we have determined during this period to make all these adjustments free. You can readily understand that the company would be put in an embarrassing position before the community if a consumer sent for us to adjust a burner on the range, which adjustment was made necessary by this change, if we attempted to charge him 50 cents or $1 for doing that work. He would have every reason to say that we were taking advantage of him, and would have every reason to complain about the attitude of the company. If he made a complaint of that kind to the mayor or council, it would do us a great deal of harm, because it would be a cheap kind of thing for us to do when we are making a change of this kind. If the change does bring about any inconveniences or hardship to the consumer, it is up to us to remedy it free of charge.

"Now, we know that that rule is subject to a very considerable amount of abuse. I know perfectly well in every city and every community there are people who are going to take advantage of a situation like this whenever it presents itself. There are consumers, and fortunately for human nature they are few in number, who are going to take advantage of this occasion and call for us to fix everything they have in the house. Now, what I want you to realize is that we have discounted them in advance. We know some consumers will do that, but we want you to go ahead and fix it. We do not want you to engage in a controversy. We do not want you to tell them that they are taking advantage of the company, that they know these adjustments would have had to be done anyhow. Don't do that; go ahead and fix it, just as if it were required because of what we have done. Leave the consumer under the impression that he has put something over on us, if that will make him feel any better. Leave him satisfied; don't leave him worked up as a result of an argument. I want to impress this upon you particularly, for I have, in making talks throughout the system, had quite a number of questions from the men indicating that they thought we ought to be a little careful about this, as we were liable to be taken advantage of, and I want to impress upon you that we know we are going to be taken advantage of in some cases, but we are going to stand for it, and as I go on, you will appreciate why we are willing to do it.

"The next, and from the consumers' standpoint, the most important phase of this question is, "What is going to be the effect of this change upon the consumers' bills?" My experience in public utility life in operating railroads, gas and electric light plants is that the consumer will stand for an impairment of his service; he will stand for the trolley cars stopping for half an hour because the wire is broken, or the burner being out on his stove—he will stand for these, provided they do not cost him any more money. As soon as you say you want 6 cents fare, or a higher rate for gas, he protests. Therefore, the important question that is going to be asked every man representing the company from now on—and doubtless has been asked all of you several times, is "Is this going to cost us any more money?"

"I want to discuss that question with you and put you in a position to answer it frankly and accurately. My answer is that so far as we can judge, based upon the experience of other companies, it is not going to cost the consumer any more. Now, why do I say that? Well, to go back to Massachusetts: As I told you, this standard has been in effect in the State of Massachusetts for over two and a half years, and the gas men tell us that they cannot see any difference in the service, nor can they see any appreciable increase in the consumption of gas. Now, that was confirmed the other day by the engineer of the Massachusetts Commission, who appeared before the Public Utility Commission of the State of of New Jersey on the application of the Public Service Company for an increase in rate and a reduction of the B.t.u. standard. The New Jersey Commission asked the engineer of the Massachusetts Commission this question which I am now discussing with you: "In the experience of the Massachusetts Commission what has been the effect of the reduction in B.t.u. on the consumers' bills?" And his answer was that so far as the commission could see, there had been no effect. That is about as high and reliable testimony as it seems to me we could get on that subject. Here is a man engaged to represent the consumer, not the gas company, and his testimony, after two and a half years' experience with the standard we are about to put into effect, is that the change was not noticeable in the bills. We had the same testimony from the Dominion of Canada. The City of Chicago has recently put in this change, or a change similar to this. Of course, they vary in some details, but the effect on the standard is very much alike. The experience of the city of Chicago has been just as I described. They have had no serious complaint of high bills. Our experience out on the main line is in line with the experience of Massachusetts, as the reduction of B.t.u. so far as we can see, has had no appreciable effect on the consumers' bills. In this meeting I referred to Mr. Schaefer having stated to his men that not only had the change to the use of this lower B.t.u. gas had no effect upon his appliances, but so far as he could see, his bills had been just a little less. What I want you to feel and be in a position to say to our consumers is, as Mr. Bodine wrote in his letter to the mayor, our best judgment, based on the experience of other plants where the standard has been put into effect, is that it is not going to result in any increased cost to the consumer.

"The consumer will naturally ask, and I have no doubt some of you are revolving in your own minds the question: 'How is that possible? You are selling a gas with a heating

value of 600, and you reduce it to 530. How is it possible that you are going to get the same results without the use of more gas?' That is a perfectly natural question for any one to ask. Now, what is the answer? So far as I know, and based upon the experience of other places, it does not show any appreciable effect. The answer, so far as I know, is this—and I am giving it to you not from a technical standpoint, for I am not a technical man, but I discuss it from the standpoint of the consumer. The answer is this: When we were making a candle-power gas of twenty-two candles, there was no specification as to the B.t.u. standard. That was left entirely to the company and took care of itself. In other words, there is no definite relation between the B.t.u. and the candle power of a gas. What we had our attention directed upon was the candle power of the gas, and the B.t.u. differed from day to day. To meet that situation there had to be necessarily a wide latitude in the adjustment of the burners to take up this varying heating value. So you see when we set aside the candle-power standard and manufacture a gas for the use to which it is going to be put, namely, for heating purposes, we can make the same kind of gas with the same heating value every day. We can keep it correct to the burner, so when you get your burner adjusted to this heating value, you are getting increased efficiency out of your burner. That, to my mind, is the answer.

"Now I want to discuss with you the necessity upon the company of doing everything in its power to put this change into effect with as little inconvenience, embarrasment and discomfort to our consumers as is humanly possible.

"Under the terms of the lease, the United Gas Improvement Company is required to sell gas at $1 per thousand cubic feet, and out of each dollar received from the consumer, to pay to the city of Philadelphia a rental which, at present, is 25 cents. In addition, the company, under the lease, makes no charge for street lights. You will see, therefore, that the United Gas Improvement Company actually receives, net, from the consumer only 75 cents per thousand cubic feet. This 75 cents must cover the cost of manufacturing and distributing the gas and the cost of all additions and betterments to the plant, which, when made, become the property of the city. The balance, if any, left after providing for the cost of the gas and the betterments and additions, represents the profit to the United Gas Improvement Company.

"While this change is only temporary, as city council has given us permission to put this change into effect until the first of January, I want to say to you men and women here, as co-workers in the company with me, this company cannot go back to a twenty-two candle-power standard; therefore, it is absolutely essential that we secure the approval and consent of the mayor and councils that this change, now temporary, be made permanent.

"Just before the war, or up to the time of the war, the average price of gas oil in the industry was about 3 cents—not over 4 cents per gallon. The average price in the industry to-day is over 12 cents. Now, it takes four gallons of oil to every thousand cubic feet when you are making a twenty-two candle-power gas, so that you will see before the war the price of oil per thousand cubic feet was 12 cents, and to-day the same quantity of oil in the same thousand cubic feet is over 48 cents. In other words, there has been an increase of 36 cents a thousand cubic feet in oil alone. As a matter of fact, we have recently had to renew one of our largest contracts at 13½ cents. When you add to that the great increase of 100 to 300 per cent in the price of coal and coke and the increase in the cost of all other materials entering into the manufacture and distribution of gas, and the increase in cost of labor, you will appreciate the extraordinary increases in cost which have come in the gas business, and any reasonable human being can understand that it is not possible to keep on making that quality of an article under this extraordinary increase in cost of manufacture and sell it for $1. This company, in attempting to do that in 1918, lost $800,000. In a further attempt to accomplish the impossible in 1919, it lost a similar amount, and that was before the increase in this price of oil had come about. I say to you, as vice-president of the company, that this year we are going to lose a great deal more than that.

"Now, don't you see how essential it is that this change in standard be made permanent? Not that it is going to save all of this loss, but it is one step in relief of the present situation of the company.

"We propose in the near future to give these facts the utmost publicity. In order to enable us to secure the necessary consent of the mayor and council to readjust this situation, it is absolutely essential to show them that this change has been put into effect to the complete satisfaction of our consumers. Now, don't you see how imperative it is, when you get a complaint, that it be handled promptly, satisfactorily, and finally, without charge?

"Now, my friends, the importance of this situation to you is that the company cannot work out this problem alone. It will be absolutely unable to secure these modifications of the standards which are necessary without the help of each and every one of you. It is you who come in contact with the public. It is you who represent the company to the consumer. Therefore, the impression he gets of the company, whether it is acting liberally and fairly with its consumers, depends upon the impression you leave with him, and the main object of my coming here this afternoon to talk with you is to impress upon you the opportunity and responsibility which come to you, as well as to me. It is a great thing for a man or woman working for a company like this to realize that in a situation so serious as this, the opportunity has come to him or her to help work out the future of that company and help to solve its difficulties, and to put it on the basis where it can continue to serve the public satisfactorily and efficiently."

Santa Barbara Gas Earnings

According to report to E. H. Rollins & Sons, the Santa Barbara Gas & Electric Company, a subsidiary of the Southern California Edison Company, for the year ending July 31, 1920, had net earnings of over 3½ times total bond interest charges, showing an increase in net of more than 15 per cent over the figures for the preceding year. The total report follows: Gross earnings, $370,703; operating expenses and taxes, $235,639; net earnings, $135,064; bond interest, $38,035; balance before depreciation, $97,035.

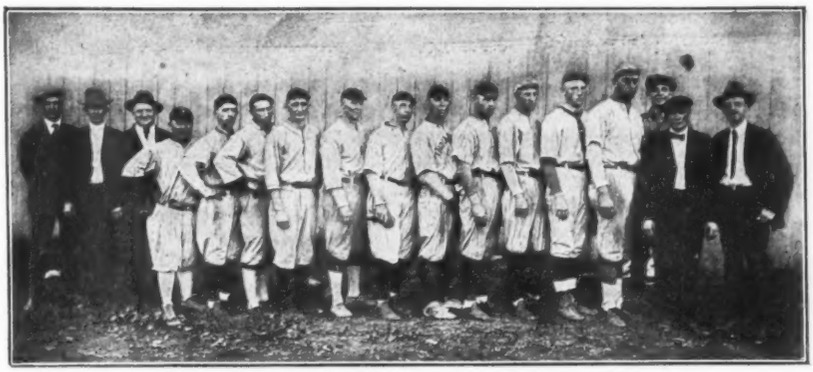
Gas Company Sold

The Imperial Valley Gas Company, El Centro, Col., has been sold to W. F. Holt at a reported price of $4,000. It is said that taxes are due on the property amounting to $8,000 which must be paid by the purchaser.

Championship Awarded to Western Gas Construction Team

Meeting and defeating strong industrial teams seems to be an easy matter for this capable-looking group of gas men, who work and play under the banner of the Western Gas Construction Company. Struggling for the title in the Fort Wayne Industrial Baseball League, this team defeated the General Electric Company in two successive championship contests, thereby taking a firm hold on a large silver loving cup which was donated by the Spalding Sporting Goods Company to be awarded the victors of this contest. The team added further laurels to their prowess by defeating the baseball nine of the Chicago "Erecting Crew," by the score of 7 to 4, the game being staged in the latter city, and necessitating ten innings to decide the contest.

The men are thoroughly in accord with the principles of the "Western" company, and in business as well as during recreation periods, a teamwork spirit predominates.



CHAMPION BASEBALL TEAM OF THE WESTERN GAS CONSTRUCTION COMPANY

Gas Rate of Ottumwa Advanced 20 Per Cent

An increase in gas rates, amounting to approximately 20 per cent on domestic rates, and a further increase on commercial rates, has been granted to the Ottumwa (Iowa) Gas Company by the city council.

The increase was granted as a result of a petition from the company, presented several months ago, asking for increased rates to meet the increased costs of coal, coke, oil and other materials used in the manufacture of gas, and freight rates.

The new rates constitute a sliding scale as follows:

	New Rate	Old Rate
First 5,000 ft.	$1.80	$1.50
Second 5,000 ft.	1.70	1.35
Third 5,000 ft.	1.60	1.20
Next 10,000 ft.	1.55	1.05
In excess of 10,000 ft.	1.50	1.00

The company asked rates of $2 for the first 5,000 ft.; $1.85 for the second 5,000 ft.; $1.65 for the next 10,000 ft., and $1.35 for all in excess of 10,000 ft. consumed.

The new schedule of rates will be given a three months' trial, during which time the company has agreed to make all necessary adjustments of gas appliances for the first thirty days free of charge, keep the number of B.t.u.'s or heating qualities of the gas, the same as in the past, purchase enough meters and lay service pipes to fill all orders then on hand or that may come in and will make every effort to reduce as much as possible the amount of gas consumed and the cost of producing the gas. The company will also endeavor to secure a three months' supply of materials at the lowest prices and earliest possible time.

The city installed a meter testing apparatus for gas meters and a city tester will see that the consumer gets all the gas he pays for.

"In our opinion there was no question but that we would have to grant an increase of rates," stated members of the city countil. "Other Iowa cities have had to grant increases, and with the new schedule, Ottumwa is getting cheaper gas than most other Iowa cities. Had we taken the case to the courts there is no doubt but that a larger increase would have been granted, as this has been the experience of several other Iowa cities.

"For the past sixty days we have been investigating the gas situation in other cities. Ft. Dodge and Mason City, two cities where the gas consumed is about equal to that in Ottumwa, pay $2.02 and $2, respectively, for their domestic gas. Cedar Rapids, consuming three times as much gas as Ottumwa, pays a rate of $1.40 to $1.50. Fairfield and Oskaloosa, both smaller than Ottumwa, pay a $2.25 rate.

"The new rating gives the company an increase of about 55 per cent over that of the pre-war period, including an increase granted two years ago. Since that time the materials used in the manufacture of gas have taken considerably greater increases. The company is paying three times as much for oil, two and one-half to three times as much for coal, and two and one-half times as much for labor as it did before the war. We failed to see where we could gain anything by going into the courts, as these matters would be considered and would undoubtedly result in a higher rate being granted by court order."

"While the new rate is not as large as we asked and we do not know if it will be sufficient, we agreed to it in order to prevent court litigation and expense," A. J. Goss, manager of the Ottumwa Gas Company, stated following the council's action.

"The sliding scale makes it practically impossible to estimate just what the increased revenue will amount to. However, we expect to give the new rates a three months' trial and our intention is to do everything possible to hold down the cost of producing gas and to 'get by' under this new rate," he said.

"The company is making every effort to get in a three months' supply of necessary materials. Five cars of oil are en route here, but we are experiencing difficulty in securing coke and coal."

New Department Organized

The Citizens Gas Company, Indianapolis, Ind., has announced the organization of a new department, known as the public relations department. The new department will give out information to the public, investigate complaints and rectify errors. Lewis K. Murchie is the manager.

HARRY A. BEATTY has been appointed representative of the National Store Company of Lorain, Ohio, in Wisconsin and Illinois, with headquarters at Milwaukee.

Oswego Gas Company Insures Employees

Eighty-five per cent of the employees of the People's Gas & Electric Company, Oswego, N. Y., have signified their desire to form a mutual benefit association and take advantage of the proposed combination plan fostered by the Life Extension Institute, Inc., of New York City, in conjunction with five of the largest insurance companies writing group insurance.

The plant referred to went into effect Sept. 1, 1920. This plan contemplates the annual health service of the Life Extension Institute, coupled with group life insurance and group health insurance. Each employee who desires to become a member of the "People's Gas & Electric Company's Employees Mutual Benefit Association" will have issued to him a $1,000 life insurance policy and a health and accident policy paying $10 per week for disability during a period of fifty-two weeks. The accident insurance is in addition to that granted by the workmen compensation law and covers all accidents occurring away from the plant as well as all cases of sickness.

This disability insurance commences at the end of the first week of disability, and confinement to the house is not requisite, inability to work being the sole governing factor. The insurance is in force during the continuance of the employment with the People's Gas & Electric Company.

Credit for introducing the plan here is due to R. F. Burnett, manager of the local plant which is one of the companies coming under the Tenney Company control.

It has been exceedingly gratifying to Mr. Burnett to have the employees of the People's Gas & Electric Company respond so quickly to this plan of co-operation in which the cost is divided between the employees and the management.

Advantage of State Commission Regulation Shown in Comparison of Rates in Illinois and Iowa

Gas rates in Illinois are 30 to 60 per cent cheaper than in Iowa, which State has no public utilities commission having jurisdiction over prices and service.

In Iowa the price paid by the householder is still a matter of dickering between the utilities and the many city councils, the State being one of the remaining five of the Union which has not adopted regulation of all utilities by a single State body having continuing jurisdiction and able to adjust rates as conditions require.

A comparison of official figures of existing gas rates in Iowa under so-called "home rule" regulation and in Illinois under "State commission regulation," the cities in the two States compared being of similar size, clearly indicates the benefits that have accrued to Illinois gas users in the shape of prices, regardless of the tremendously increased operating expenses of the companies. It completely explodes the "yarn" that under so-called "home rule" the citizen obtains lower utility rates.

The comparison is based on prices for gas as of Sept. 1, being the net rate per thousand cubic feet, and is as follows:

Iowa City	Rate Fixed by so-called "Home Rule"
Albia	$2.00
Ames	2.25
Anamosa	2.75
Boone	1.60
Cedar Rapids	1.50
Chariton	1.80
Charles City	1.60
Cherokee	2.00
Council Bluffs	1.40
Creston	2.00
Davenport	1.40
Decorah	1.90
Des Moines	1.25
Dubuque	1.70
Fairfield	2.25
Fort Dodge	1.90
Fort Madison	1.65
Hampton	2.10
Iowa City	1.70
Iowa Falls	2.50
Keokuk	1.60
Mason City	1.90
Muscatine	1.55
Oskaloosa	1.90
Ottumwa	1.80
Storm Lake	2.00
Vinton	2.00
Washington	1.80
*Waterloo	1.45
Waverly	2.00

*Waterloo has a service charge—not a minimum charge—of 50 cents per month per customer, which makes an average rate of approximately $1.65 per 1,000 cu. ft.

Illinois City	Rate Fixed by State Utility Commission
Edwardsville	$1.15
Centralia	1.55
Morrison	1.70
Canton	1.40
Rockford	1.25
Macomb	1.65
Clinton	1.50
Taylorsville	1.75
Rock Island	1.30
Belvidere	1.60
Springfield	1.25
Mendota	1.70
East St. Louis	1.00
Quincy	1.35
Beardstown	1.65
Galesburg	1.25
DuQuoin	1.25
Geneseo	1.70
Kankakee	1.15
Princeton	1.75
Jacksonville	1.30
Chicago Heights	1.50
Freeport	1.35
DeKalb	1.60
Alton	1.70
Sycamore	1.60
Rochelle	1.15
Hoopeston	1.40
Moline	1.30
Savanna	1.70

Gas Well Struck

A gas well has been struck near Gays, Ill., and the flow is reported quite strong and will be used for cooking and lighting purposes.

Supreme Court Perpetually Enjoins Gas Workers' Strike

Judge Pierce of the Supreme Court has issued an injunction restraining members of Gashouse Workers' Union of Cambridge, Mass., from interfering with the business of the Cambridge Gas Light Company. The injunction also operates against the Cambridge Central Labor Union, the International Union of Steam and Operating Engineers No. 664, and the International Brotherhood of Stationary Firemen No. 3, of Boston.

By the terms of the injunction the respondents are forbidden to picket the plant or to carry banners in the vicinity of the plant, or to aid the strike in any way or threaten or annoy persons now employed, or those who may become employees.

Prairie Oil Pays $5 Extra

The Prairie Oil Gas Company has declared an extra dividend of $5 a share in addition to the regular quarterly dividend of $3 a share. Both are payable Oct. 13 to stock of record Sept. 13. For the preceding quarter an extra dividend of $3 a share was declared.

New Holder Will Prevent Gas Shortage This Winter

There is very little danger of a repetition this season of last winter's gas shortage in Long Beach and San Pedro, Cal.

The new gas holder there, which has a capacity of 2,000,000 cu. ft. of gas, will eliminate all possibility of lack of fuel this winter and also will be ample for the needs of the harbor cities for some time to come.

The holder will be ready for use before the heavy gas consumption of the year's end starts, and with the present tank there will be sufficient gas to supply both Long Beach and San Pedro.

The new fabrication was lifted back into place with huge hydraulic jacks. After it settled several inches the water which is used to seal the gas into the tank was pumped in.

"The tank's capacity is 5,000,000 gal. of water, which has an approximate weight of 20,000 tons. This terrific pressure added to the weight of the tank itself and to its concrete foundation, forced more or less displacement of the ground upon which it stands. The plant is located on filled land, and, of course the latter had to settle beneath so tremendous a weight.

State Forbids Company to Shut Off Gas Supply

The power of the Public Service Commission to compel a corporation to furnish natural gas to another corporation under a private contract was raised at the hearing of complaints of the Cambria Steel Company and the city of Johnstown, Pa., against the Johnstown Peoples Natural Gas Company.

The case, which originally was a rate complaint, has been through the Superior and Supreme Courts, in which the commission was sustained last May, and was brought up for a hearing through a notice by the Peoples Natural Gas Company that October 1 it would shut off service to the Johnstown Fuel Company.

The gas company raised the question of the commission's jurisdiction, and, at its suggestion, Commissioner John S. Rilling issued an order to the Peoples Natural Gas Company by which it will continue service in Johnstown until December 1. In the meantime, arguments are to be held before the entire commission and hearings will follow if necessary.

Attorneys for the parties in an informal discussion before Commissioner Rilling, went over the points involved and George S. Gordon for the Peoples Gas Company asserted the old cases were closed when the company filed with the commission on July 24, a tariff covering its charges to the Johnstown Fuel Supply Company in compliance with an order made by the commission in December, 1917. Mr. Gordon said the Peoples Gas Company would cut off the supply of gas to Johnstown Oct. 1 and that notice was served more than a year ago.

"We feel it our legal duty to supply our customers in Pittsburgh, Altoona, Derry and other places where the supply of natural gas is getting low," he said. "Our primary duty is to these communities and we must cut off the supply to other public service companies."

Mr. Gordon said Johnstown was in the center of a coal field and most of the homes were equipped to use coal and there would be no calamity.

Bemidji City Council Makes Change in Gas Franchise

Changes in the franchise granted the Bemidji (Minn.) Gas Company will be made at once to allow the producer to increase the rate for gas to the consumer to $2.75 per thousand cubic feet, with a minimum charge of $2 per month, as a result of the action taken by the city council.

The company has been operating at a loss under the former rate of $1.80 per thousand feet and at the last meeting of the council a request wa made by the gas company to have a committee appointed to investigate the situation at once. J. L. George representing the gas company at the meeting asked for the establishment of a rate fixed at $3 per thousand cubic feet, but this was cut down by the council before the change was granted.

Bemidji is not the only city which is confronted by this same situation. Communications from Brainerd, Crookston and Moorhead show that those cities are laoring under a similar problem. In most cases the increase in rates asked is in excess of the amount in Bemidji.

Questionnaires were sent out a short time ago to the local consumers with a view to obtaining their sentiment regarding the situation and the advisability of a raise in price. As a result every returned card brought evidence that the consumer desired to have the gas company continue at a rate at which it could operate without loss.

Watertown Votes on Gas Franchise

The franchise of the Watertown (S. D.) Gas Company passed by the city council and referred to a vote of the people was approved at a special election by a majority of 51 votes.

Lack of widespead interest in the election was reflected by the total vote, which reached only 260. There were 155 votes for the franchise and 104 against it.

The franchise, which runs for a period of twenty years, provides that the gas rate shall be $2.50 per 1,000 cu. ft., an increase of 60 cents over the present rate, after November 1 and until a new basis for rates is established.

Rates are to be fixed from time to time by the gas company officials and governing body of the city at a figure that will give the company a return of 6½ per cent on the value of the plant and also cover operating expenses as well as provide a fund of 5 per cent for depreciation and maintenance.

The city is given the right to buy the plant at any time on approval of a bond issue by the people

$50,000 Fire in Indianapolis Gas Plant

A fire which broke out in the screening room and coke house of the Prospect Street plant of the Citizens Gas Company, Indianapolis, Ind., destroyed large quantities of coke, causing a loss estimated at $50,000. The fire was discovered at the top of the coke house, a three-story corrugated iron structure.

The upper stories of the building and equipment were badly damaged. The origin of the fire has not been definitely determined but it is believed it was caused from a spark from electric wires. Officials of the company said the loss would result mainly from the damage to the building and equipment.

75,000,000-Ft. Gasser in Texas

A 75,000,000-ft. gasser has come in on the Radford farm, seven miles north of Eastland, Texas, according to report received by the oil and gas division of the Railroad Commission from D. E. Woods, deputy oil and gas supervisor. The well was brought in by the States Oil Corporation.

Supreme Court Holds $1 Gas Rate Illegal

Under a ruling made by Justice Charles E. Nichols of the Supreme Court the Municipal Gas Company of Albany, N. Y., is empowered to charge as much in excess of the rate of $1 per 1,000 cu. ft. as may be necessary to yield not in excess of 6 per cent on the company's capitalization of $1,821,876.

The court's decision was made in the case of the Public Service Commission, the State Attorney General and the county and city of Albany to restrain the gas company from charging more than $1 per 1,000 cu. ft. The gas company now is enforcing a rate of $1.30, the legality of which is expected to be determined by the result of the present suit.

The ruling came as the result of a restraining action by the State, county and city officials brought in Supreme Court on March 31, 1919. The action was tried before Justice Nichols without a jury, Deputy Attorney General Wilber W. Chambers appearing for the attorney general, Assistant Corporation Counsel John J. McManus for the city and Attorney Neile F. Towner for the Municipal Gas Company.

Justice Nichols holds that the provision of law fixing the maximum price of gas at $1 per 1,000 cu. ft. to be unconstitutional and void "in that it has operated, and now operates, to deprive the plaintiff of its property without due process of law and in violation of the constitution of the State of New York and of the fourteenth amendment of the Constitution of the United States."

Continuing, the decision says:

"It is further ordered, adjudged and decreed, that the defendants and each of them and each of their attorneys, agents, servants, employees or successors in office, be and they hereby are restrained from in any way enforcing or attempting to enforce as against the plaintiff, any of the penalties or forfeitures under the provisions of chapter 227 of the laws of 1907, or of the Public Service Commission law, or any other statute with reference to the manufacture, furnishing or sale by plaintiff in the city of Albany, of gas at a higher rate than $1 per thousand cubic feet, or in any wise interfering with plaintiff or its property or its business by the commencement of any action, or proceeding which would prevent or tend to prevent plaintiff from making a sale of gas in the city of Albany, in excess of $1 per thousand cubic feet.

"It is further ordered, adjudged and decreed, that plaintiff may retain and hold any sums received and collected by it or due or to become due in excess of $1 per thousand cubic feet for gas manufactured, furnished or sold by plaintiff to its consumers in the city of Albany, since Sept. 26, 1918, to the date of this judgment.

"It is further ordered, adjudged and decreed, that as long as plaintiff under the judgment herein is allowed to charge in excess of $1 per thousand cubic feet for gas sold to its consumers in the city of Albany, plaintiff may charge a rate which will yield not to exceed 6 per cent per annum on said rate based as found herein, namely, $1,821,876 changed by future additions and subtractions as the case may be; that in determining its future operating costs the plaintiff shall not include for annual amortization, or whatever name such account may be designated, a higher percentage than allowed by the court in the opinion and decision herein and the rulings of the court with deference to all operating costs as laid down in the opinion and decision herein are to be followed."

Massachusetts Gas Report

Combined net earnings available for dividends of Massachusetts Gas Companies for August were $411,072, an increase of $114,699, or 38.70 per cent., compared with corresponding month a year ago.

Net earnings for the month of August compare as follows:

	1920	1919
Boston	$21,935	$31,592
East Boston ...	*5,670	*3,198
Citizens' Gas...	4,831	7,484
Newton	*7,147	*2,858
Total	13,948	33,019
†Comm'l Cos...	397,124	263,353
Total	411,073	296,373

Net earnings of subsidiary companies for eight months ended Aug. 31, 1920, compare:

	1920	1919
Boston	$489,516	$732,679
East Boston ...	33,225	2,758
Citizens' Gas ..	44,973	46,036
Newton	58,805	19,903
Total	626,521	801,377
†Comm'l Cos...	2,387,548	1,340,335
Total	3,014,070	2,141,713

*Decrease. †Not including Beacon Oil Company.

Lincoln Is Placed Upon Gas Diet

The gas situation in Lincoln, Ill., is most serious at the present time. There is no gas coal in sight, and the new retorts are not yet capable of producing gas.

It has become necessary to place the city on a gas diet. The pressure is greatly lowered during the hours not ordinarily used in cooking meals, and also at night time. This is resulting in an improved pressure just before meal time, by adding to the reserve store of gas.

The situation in the public utilities field as a result of increases in coal prices is described by John J. McArdle, vice chairman of the Indiana Public Service Commission, as chaotic.

"Apparently the public does not fully appreciate the peril of the present situation," Mr. McArdles says. "A large number of public utilities, especially those which operate electric and gas plants and are large consumers of coal, not only have not been able to build up a reserve supply for the winter, but on the whole have no more than 75 per cent of the supply on hand of one year ago when their reserve was seriously depleted. They are, so to speak, living from hand to mouth. In a few instances they have been forced to close down for lack of coal.

"Among the gas utilities, the situation with respect to coal is even worse. Nine gas utilities have made reports to the Indiana commission. They report a total of 12,373 tons of gas fuel on hand as compared with a total of 34,348 tons on hand Aug. 1, 1919. Fourteen companies have contracts for their coal supply, and of this number only two are getting their requirements from the companies with which they have contracts. Most of the others are getting 50 per cent or less of their requirements.

"The Indiana commission has been severely criticised as a rate-making body. The truth is there has been a continual advance in the price of coal for the last year, and when it is recalled that coal commands about 50 per cent of the total operating cost of the average electrical utility, the effect of increased coal prices can be readily understood. The public does not seem to have considered the situation with which utility companies have had to grapple or the situation with which the commission has had to deal in order to keep the public utilities of the State at least one jump ahead of the sheriff."